MAY
1954

DIGEST

INTERNATIONAL BUSINESS AND INDUSTRY

THE U.S. MARKET can mean money to you. But it's an unusual market and it needs your special attention. p13

NEW PRODUCTS and better old ones help you hold your place against competition. And a modern program helps you develop products. p15

CONSTRUCTION is one of the U.S. largest industries. And it is alert for new and better ways of doing things. You may profit from today's trends. p22

THE SEA holds many minerals. The problem: how to recover them. New process obtains fertilizer. p28

PLASTICS PIPE heads for huge new markets. An aggressive manufacturer can assure his share now. p34

TOO-HARD-TO-MACHINE materials present no problem to arc machining. New equipment cuts complex holes through the hardest material. p37

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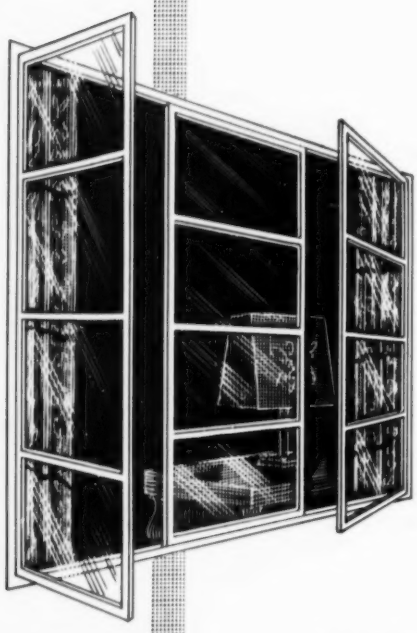

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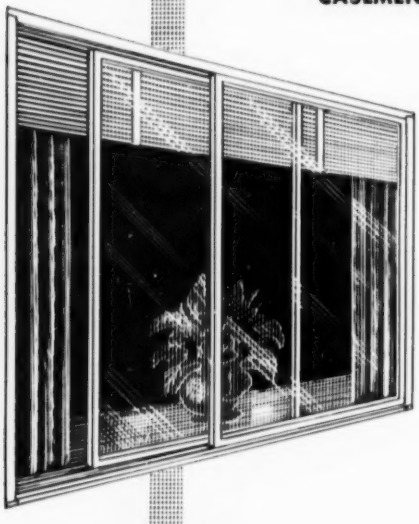

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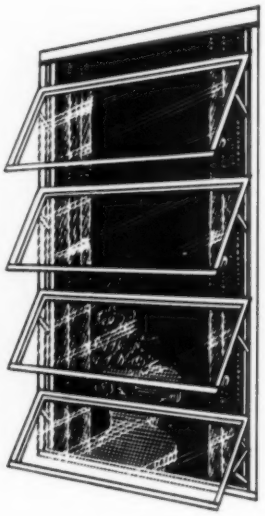

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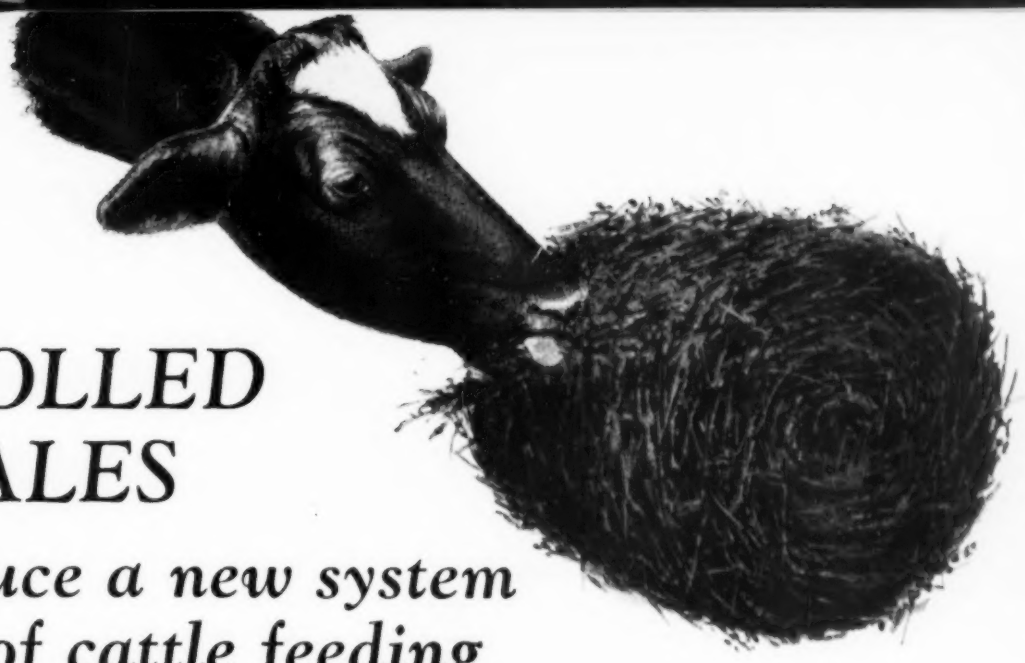

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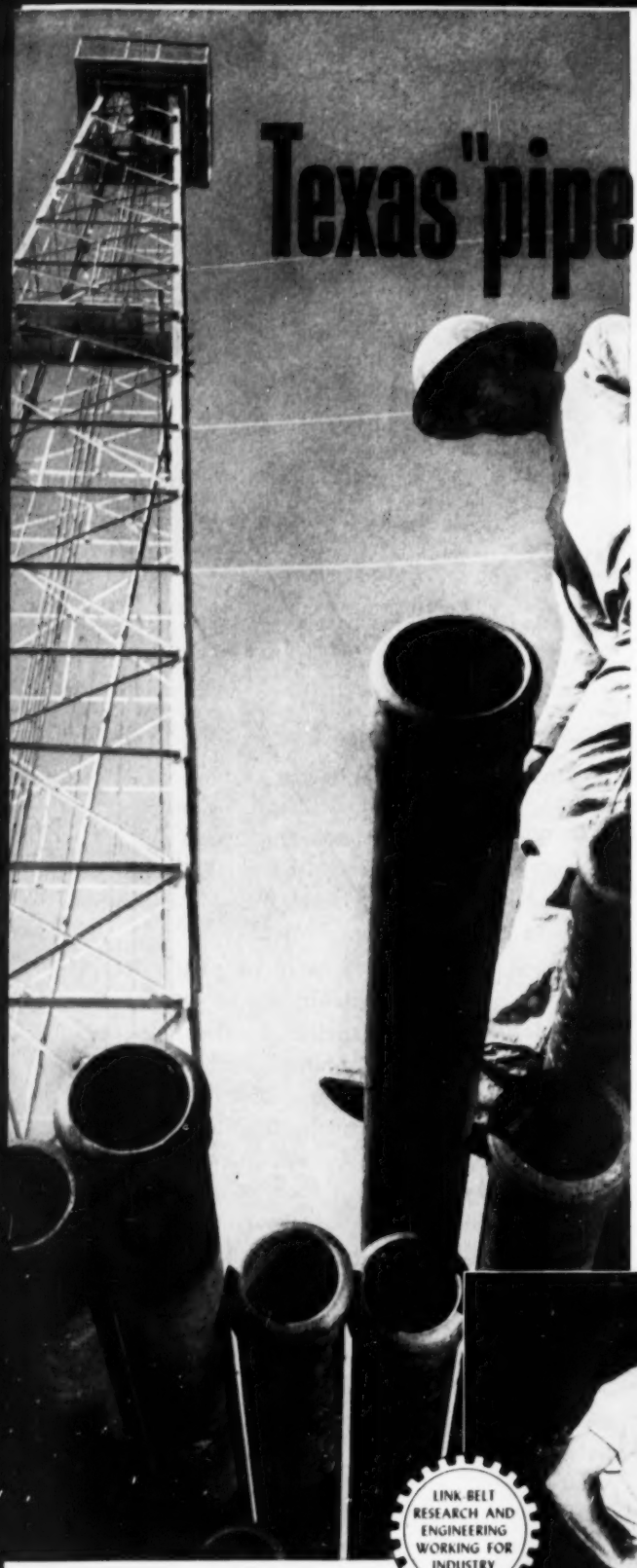

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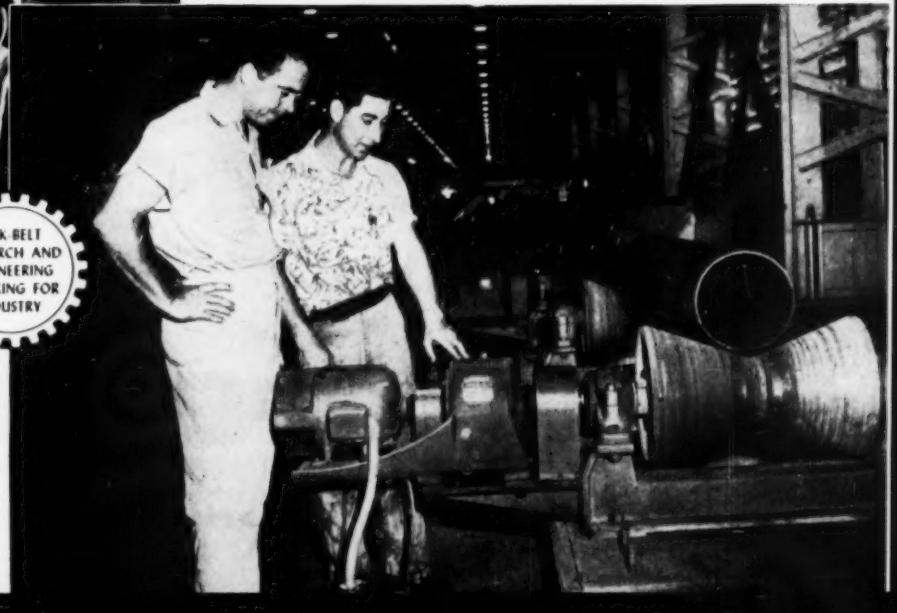

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May 1954 | McGRAW-HILL DIGEST | Vol. 9—No. 5

Member—Audit Bureau of Circulations

Published monthly by McGraw-Hill International Corporation for circulation in all countries of the world except the United States and Canada. *Publication office:* 99-129 North Broadway, Albany 1, N. Y., U. S. A. *Executive and editorial offices:* 330 West 42nd St., New York 36, N. Y., U. S. A. Donald C. McGraw, Chairman of the Board; Willard T. Chevalier, President; Eugene P. Warner, Senior Vice-President; Joseph A. Gerardi, Treasurer; John C. Cooke, Secretary; J. C. Stark, Vice-President Publications Division; K. Presbrey Bliss, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Director of Circulation.

Subscriptions may be ordered through Director of Circulation, through local book dealer, or McGraw-Hill Publishing Co., Ltd., McGraw-Hill House, 95 Farringdon St., London, E.C. 4 (British only). Subscription rates: $5 for 1 year, $8 for 2 years, or $10 for 3 years; single copy 50¢ (U.S. currency). Entered as second-class matter January 1, 1953, at the post office at Albany, N. Y., under the Act of March 3, 1879.

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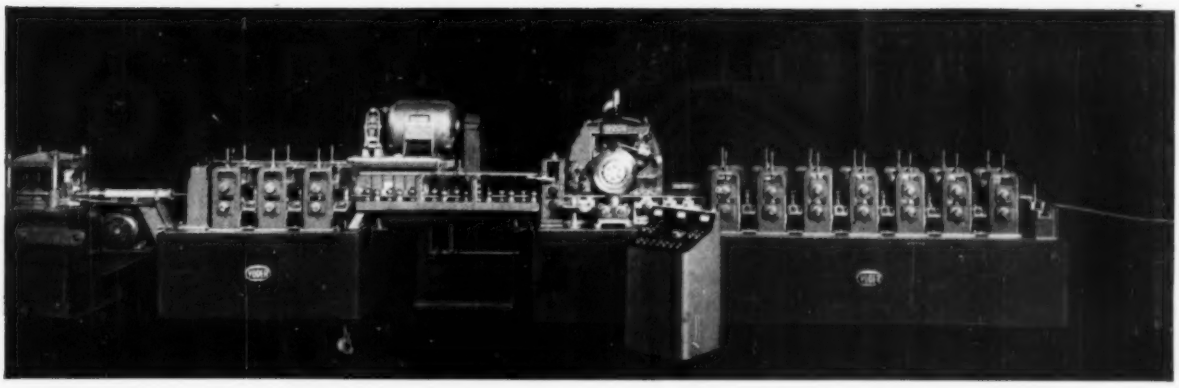

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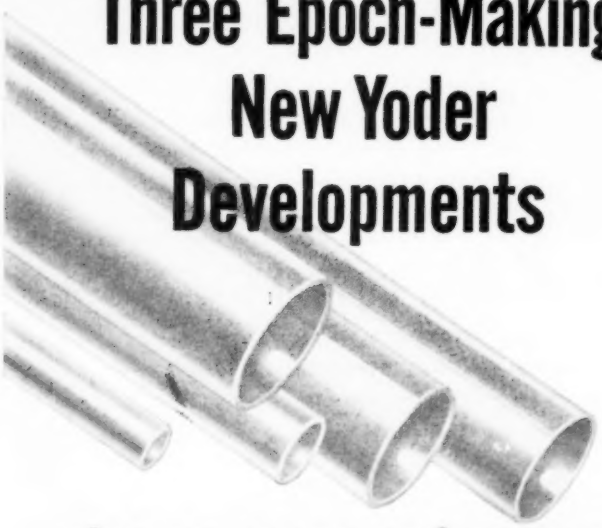

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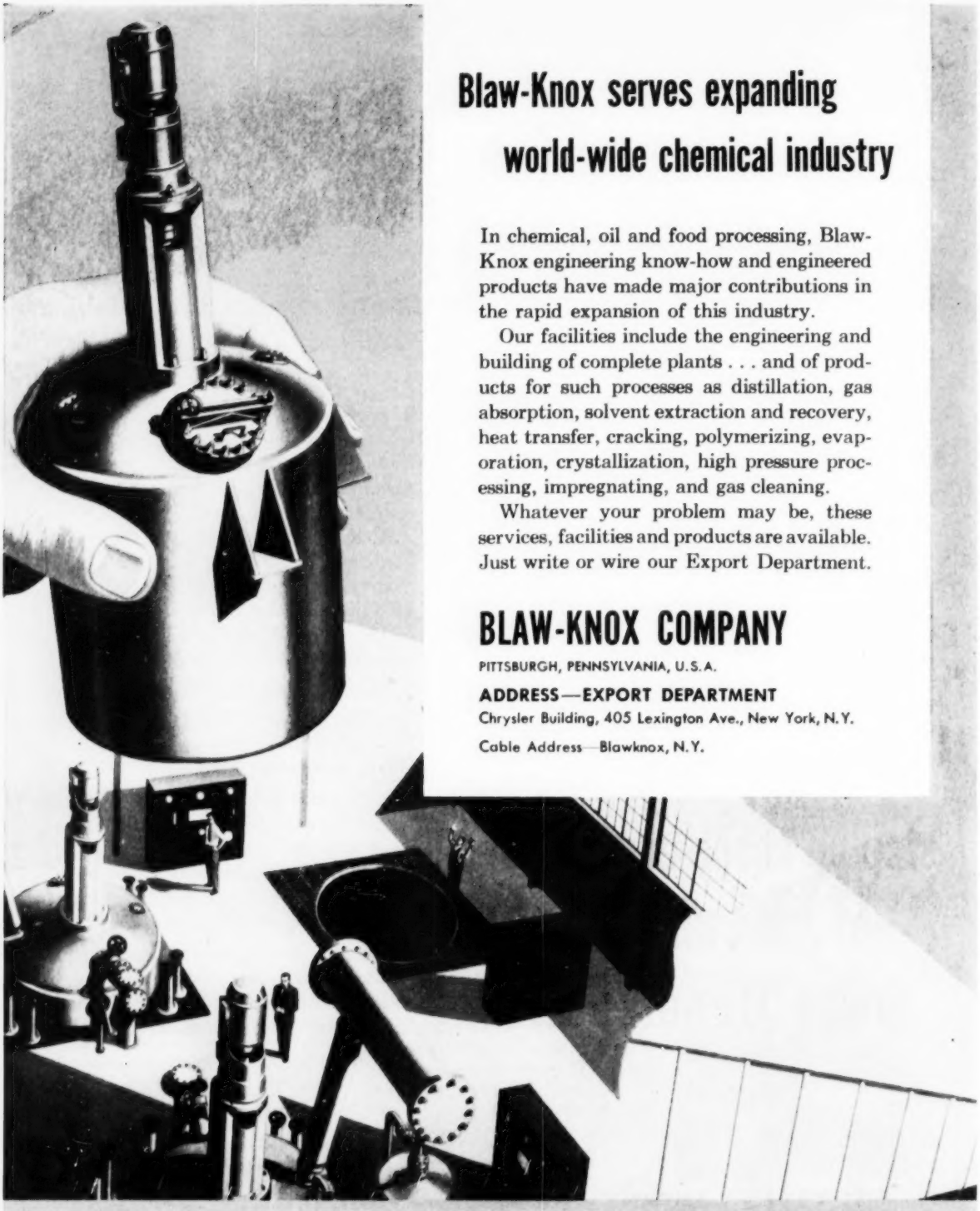

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BUSINESS

TRENDS

EMERGENCY ACTION by the government to prevent further decline in U. S. business was originally set for March. According to a recent statement by U. S. Treasury Secretary George M. Humphrey, the administration now plans to wait until later—perhaps this month—before deciding whether drastic measures are needed to cope with rising unemployment.

One reason for pushing the date back is the uncertainty over tax legislation. Another is the late Easter buying period (Easter comes 2 weeks later than it did in 1953). Principal reason, however, is that the business situation simply does not look serious enough to demand drastic government intervention.

The administration, however, is continually on the alert. No other President has kept himself more fully informed on the dangers of economic recession than President Eisenhower. Weekly conferences with his Advisory Board on Economic Growth and Stability are routine.

Major problem in analyzing business is the lack of up-to-date economic information. Most of the government's business reports lag anywhere from 2 to 6 weeks behind the month in which they were taken. So it is no coincidence that the president has ordered greater speed in the government's economic intelligence service. (For further analysis of the recession, see p25).

EUROPEAN PAYMENTS UNION will be continued after June 30—the original termination date set by the Organization for European Economic Cooperation. Fears over its fate were originally set off when the OEEC managing board failed to agree, even in principle, on terms for continuing EPU's activities.

Next step in EPU's fate will be decided at the next meeting of OEEC's Council of Ministers. Here is what you can expect from that meeting:

- **A group of Swiss banks** will lend Italy 100-million Swiss francs ($23.3-million) to relieve her extreme debtor position in the union. This will save Italy further penalties for exceeding her credit quota.

- **The Swiss will probably help** other debtor members too. This will enable her to reduce her $185-million surplus with the EPU, but the main point is that the position of the extreme debtors to the union will be bolstered.

- **Foreign Operations Administration** will grant EPU a loan to assist the union in a long-term program to liquidate its debts, (probably $50-million). Both President Eisenhower and the Randall Commission (McG-H Digest, March, p9; April, p9) realize the effect that failure of the union would have on multilateral trade.

- **Germany and other large EPU creditors,** such as Holland and Belgium, will get American support in a new formula to liquidate arrears of extreme EPU debtors. The union's credit terms will also be stiffened. Gold ratio payments to creditors will be increased and debts will be settled a lot faster.

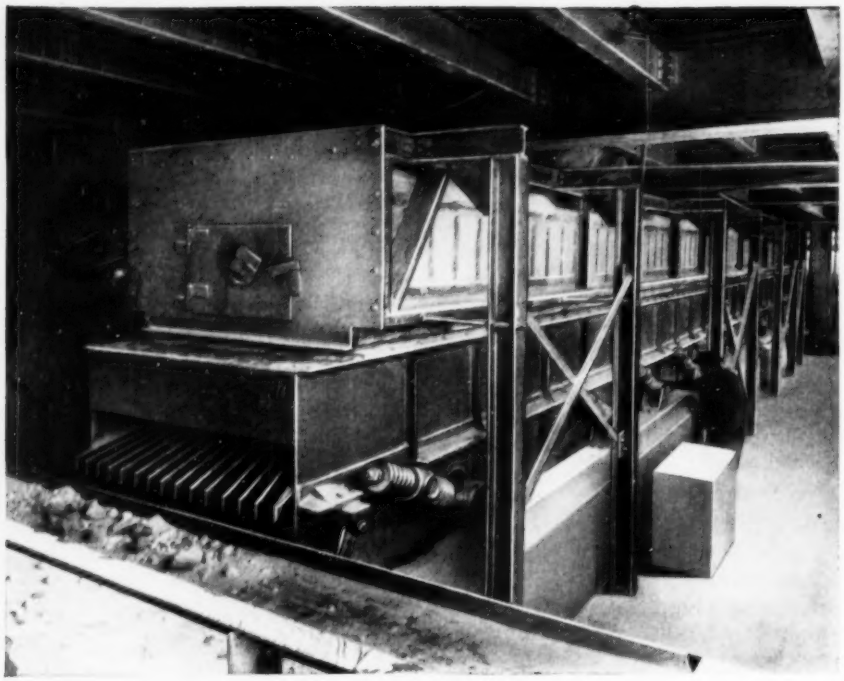
- **In turn, a program to liberalize** dollar imports will be launched. On February 17, Germany took a step in this direction when it lifted all quantitative controls on more than 2,000 import items from the dollar area.

BRITAIN gave convertibility one of its biggest boosts since the war by removal of restriction on sterling payments outside the sterling and dollar areas. Sterling and non-dollar areas, such as France, Belgium, Brazil, Argentina, Holland, Italy, will be able to settle current transactions freely with their sterling balances.

In Germany, a similar move by the Bank Deutsches Laender will permit German Mark holders to use their accounts for settlement in West Germany or for purchases in other countries. Payment by German importers will be made into foreign DM accounts. Owners of foreign DM accounts from countries where settlements with West Germany are made in freely convertible currency will use the foreign DM accounts without restrictions.

FOREIGN-EXPORT AID is increasing. The British Credits Guarantee Department assists British exporters in financing market surveys, sales and advertising, and general finance. German exporters are granted tax exemptions, easy credit terms, as do most other countries. Belgium is now setting up its own government-sponsored export credit association in answer to competition from other European countries.

American exporters are disturbed by this situation because they enjoy no such advantages. This fact was brought out at a recent meeting of the Foreign Credit Interchange Bureau. A poll of exporters by that bureau found 82% in favor of export insurance against exchange freezing, with half favoring insurance against bad debts.



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INTERNATIONAL TRENDS

From now on, this page will come to you under its brand-new title, International Trends. But not only will the title be changed. Up to this time, the page has told you what was happening in Washington to affect international business and what might happen, and it interpreted these conditions in the light of what they might mean to you.

International Trends will bring you a much wider coverage. As the name implies, it will emphasize world-wide conditions, with explanations as to their meaning, their effect, their future. You'll see datelines from all parts of the world as our news bureaus, located in over 60 leading capitals and industrial cities, collect and interpret the political, economic, and technical news—not the day-to-day news you read in newspapers, but that with long-term significance.

WASHINGTON—President Eisenhower's administration will follow a liberal, middle-of-the-road foreign economic policy. His acceptance of the Randall Commission's recommendations, as shown by his message to Congress, guarantees this course and means a little more trade and private investment overseas, strong financial support for convertibility, steady dwindling of economic aid.

Congress probably will extend the Reciprocal Trade Agreements Act for 3 years with some extra tariff-cutting power for the President. It will simplify customs regulations some more, but major customs simplification action will be put over until next year. Amendment of Buy American laws also will wait until next year.

Congress will give substantial tax concessions to foreign investors to spur the flow of private capital abroad. Government guarantees for foreign investments probably will be extended to cover loss from war or revolution.

The administration will implement major parts of the President's program without congressional action.

- **Buy-American administration** will be liberalized. U. S. bidders on government contracts no longer will get an automatic 25% price edge over foreign bidders. That means more government purchasing abroad. It's too early to say how much more.

- **Stockpiling of strategic raw materials** will be resumed and carried on indefinitely. This will benefit raw-materials producers abroad, who have been worried about sagging commodity prices. Lead and zinc producers will benefit most.

- **Washington will offer strong dollar support** for any key currencies that are made convertible. The U. S. will back use of the International Monetary Fund's resources for this purpose. Federal Reserve Bank will stand by with additional lines of credit if they are needed; these might total as much as $3-billion. A prolonged U. S. recession, of course, could torpedo this program because of congressional and business pressure for export subsidies, dumping, higher tariffs, more quotas.

CARACAS—The tenth Inter-American Conference highlighted the economic differences of the Latin American republics and the U. S. State Department. Secretary Dulles gave assurance to the economic committee, but no definite commitments. The visit of Dr. Milton Eisenhower, the President's brother, was, however, ample evidence of the administration's interest in the problem. A more liberal policy is in the offing:

- **Officials are denying it,** but pressure is building up to liberalize the lending policies of the Export-Import Bank. This was recommended by the Randall Commission.

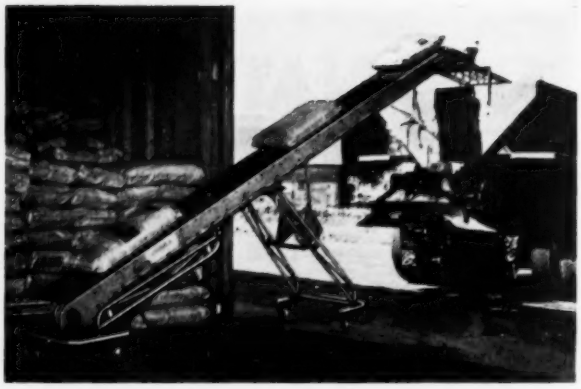
- **At the coming economic conference this fall,** the U. S. attitude toward South American economic problems will be more conciliatory.

LONDON—A new British gas-making process promises to revolutionize present gas-making techniques. Savings of millions of dollars in capital expenditures and operating costs are predicted. The method used was patented about 30 years ago, but was never brought beyond the experimental stage until 2 years ago when Northwestern Gas Board started pilot-plant development work.

The process consists of injecting gas into the base of a standard vertical retort during carbonization. This action has more than doubled carbonization speed. Retorts are now able to handle 14 to 15 tons of coal per day—more than twice ordinary operational capacity. Production capital charges per heat unit of gas produced have been halved.

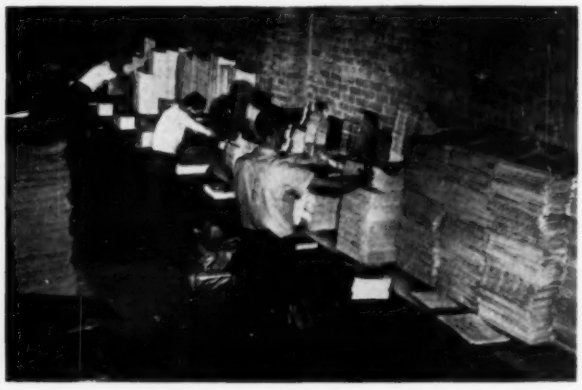
Use of slack coal has been made possible through this process without loss of efficiency, while actually making better-quality coke. Low-grade coal usually unsuitable for gas making may possibly be carbonized successfully by this process.

Goods move quickly out of basement storage on portable, lightweight, aluminum Rapistan power belt conveyor.



Portable power belt unit quickly lifts heavy bags of cement into truck; can also be used horizontally if desired.

Fast stacking; maximum use of storage space, are made possible by use of portable aluminum power belt conveyor.



Horizontal Rapistan power belt unit simplifies sorting and assembling; keeps men working at steady pace.

The profitable way to lift and carry!

Rapistan® POWER BELT CONVEYORS

Workers easily double their output – with the help of Rapistan power belt conveyors. The chance of breakage is virtually eliminated. Spoilage of perishable goods is reduced to a minimum – through faster, more gentle handling.

ONE UNIT DOES MANY JOBS – A single, portable Rapistan conveyor may be used for loading and unloading trucks . . . for stacking goods in storage . . . for temporary sorting and assembling operations. Lightweight aluminum models can be rolled from job to job by a *single workman*. Even permanently located models, like the horizontal unit shown above, are easy to install and operate.

ALL MODELS GIVE UNLIMITED SERVICE – Rapistan power belts are unusually simple to operate and require almost no care. Equally important is the fact that all couplings are standard. The units you buy today can be used with gravity-type conveyor units you bought years ago – or will buy in the future. Conveyor lines can be lengthened and shortened to meet changing needs. Your Rapistan equipment never becomes obsolete.

● ***Send for free catalog, field reports***

If you'd like to know exactly what Rapistan power belts can do for you — send for our 16-page illustrated catalog, and a report on the services of Rapistan equipment in your specific industry.

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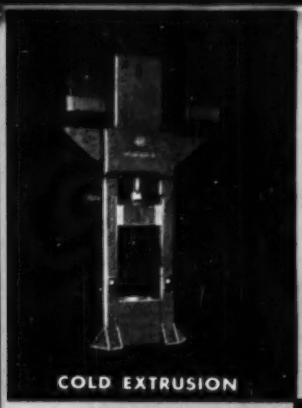
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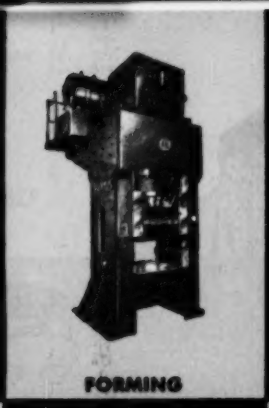
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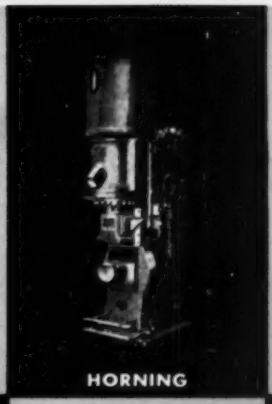
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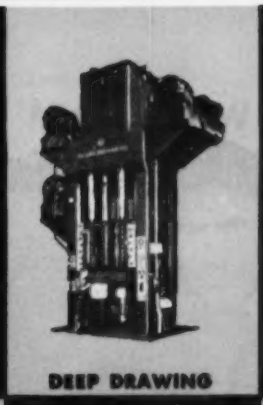
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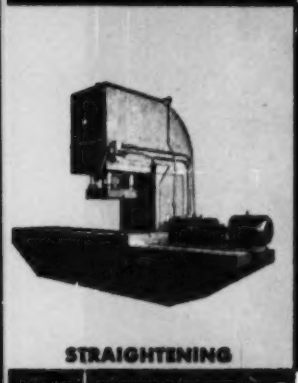
HOT FORGING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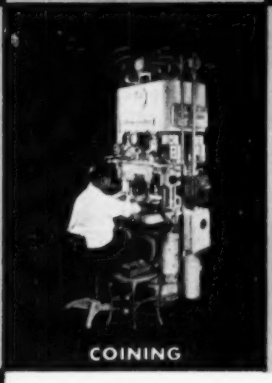
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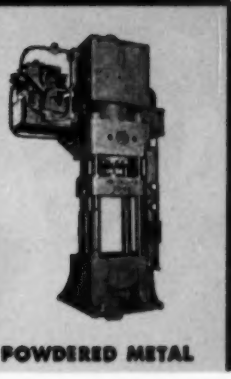
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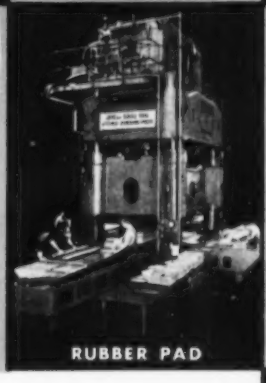
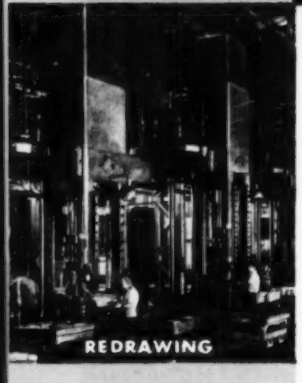

RUBBER PAD

DIE SPOTTING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MAY 1954
VOLUME 9 • NUMBER 5

McGRAW-HILL
DIGEST

Selling the American Market

IN 1946, England sold only 21,105 bicycles to the U. S. In 1953, recorded sales were ten times that amount. And now the lightweight English-style bicycle is the envy of millions of American youngsters—so much so that American manufacturers are beginning to market their own lightweight bicycles.

This experience of the English bicycle manufacturers proves that business in the dollar area can be highly profitable. It is this business that has incited earnest advice from government officials and "internationalists" abroad to sell in the American market. And such exhortations, whether from profit or patriotic motives, have been legion since the end of World War II.

Unfortunately, encouragement to sell the American market is not often accompanied with as authoritative advice on your real problem: how to sell the American market.

The dollar market can be profitable, but it is also one that makes special demands on the resources and efforts of the exporter. Fundamentally, this is due to the particular characteristics of the American market itself.

Statistically, the U. S. market is made up of 160-million customers armed with $248-billion in purchasing power. But it also includes a customer "who is always right." To say that the customer is king in the U. S. is no exaggeration and the attempts of American business to satisfy Mr. and Mrs. America have made this market highly competitive. To meet this competition in the dollar market, the foreign business man should adopt the cardinal rule that this customer-king must be catered to.

This sales approach means sales and servicing must be prompt, inventories must be adequate. Certain common American business practices, such as after-sales servicing and accepting sales rejects, must be followed.

In catering to the peculiarities

Editor's Note:

On this page and on page 15 are two articles that I want to call to your special attention. The Digest staff has researched, developed, and written them for just one purpose: to help you increase your business both at home and in export. These articles stem from nearly 30 interviews with foreign commercial attaches, trade promotion associations, importers, foreign companies, U. S. companies, and independent product-design engineers.

Harry S. Whalen

of the American market, foreign exporters have encountered these problems:

Is your working capital sufficient? Meeting the special characteristics of the American market will probably demand a larger financial outlay than other markets. If sufficient risk capital is available in your country, financing can be carried on through normal banking channels. If not, it will have to be provided by other means.

To assist English exporters, the British government has set up an Export Credits Guarantee Department.

In Austria, an export credit agency, Osterreichische Export-Fond, extends short-term credit to Austrian exporters at cheap rates. In addition, a government law provides for export credit guarantees.

In Belgium, a private agency, Du Ducroire, has been insuring Belgian exporters at cheap rates. A project is now before the National Assembly for the establishment of an Export Credit Corporation to meet the shortage of risk capital. For financial assistance toward putting their products on the American market, the Italian Handicraft manufacturers went to the U. S. Export-Import Bank.

In some instances, particular financing problems can be shared by both the importer and the exporter. This is a common practice.

How much production can you make available? Once your product is launched, sales turnover can be quite fast. The exporter to the U. S. market should be sure that he can allocate sufficient production to insure prompt deliveries.

Will Delivery Be Prompt?

Many American retailers hesitate buying foreign goods because they dislike the delays involved in placing orders overseas. This point is particularly important in the face of the current U. S. business recession. One large American import house reports that dealers are ordering only from stock on a day-to-day basis.

Is the product styled to the market? As the customer is king in the dollar market, styling or designing your product to meet his tastes is essential. Slavish imitation of American products is neither necessary nor desirable. In fact, those products that often meet with the most success in the eyes of the U. S. buyer are those combining both foreign and American taste.

The Italian leathercraft manufacturers have been eminently successful in this field, as the sales of their ladies' handbags in the U. S. will attest. In Denmark, the furniture industry has employed the talents of two of its finest architects, Fin Juhl and Hans Weener, in styling its products specifically for the American market. The German firm of Rosenthal has employed the talents of the American designer, Raymond Loewy, in designing its American-destined chinaware.

Best results can sometimes be obtained by a close analysis of designs on the U. S. market itself. The French toy manufacturers have done this. They have modified their models and are now entering the U. S. market in full force.

If your product is such that it cannot be styled, taste must be created for the merchandise. The Belgian endive growers now include a little booklet with their product, giving recipes to American housewives for its preparation.

Is there a place for your product on the American market? The solution to this important question can save you innumerable difficulties. It can be solved either by canvassing prospective buyers or by making a full-scale market analysis.

Some countries, such as Germany, England, and Belgium, conduct and finance market analyses for their exporters when the need arises. Some large foreign organizations, such as the Belgian Societe Generale, make surveys for their own clients. Or the services of American marketing research organizations can be employed to get the answer.

What about distribution? Advertising and promotion are an important part of selling the U. S market. You will be expected to share the costs of this important aspect of putting your product over to the American buyer.

The first step is proper packaging as packaging occupies a large place in the American manufacturer's sales budget. U. S. sales of a common staple such as rice have risen 300% since 1940, primarily because of its presentation as an attractively packaged specialty product. Packaging tastes are, however, constantly changing in the American market. Failure to keep up with the latest packaging techniques, such as the "flexibles" (plastics), can lose sales. Probably the simplest solution is for you to work out the problem with your importer.

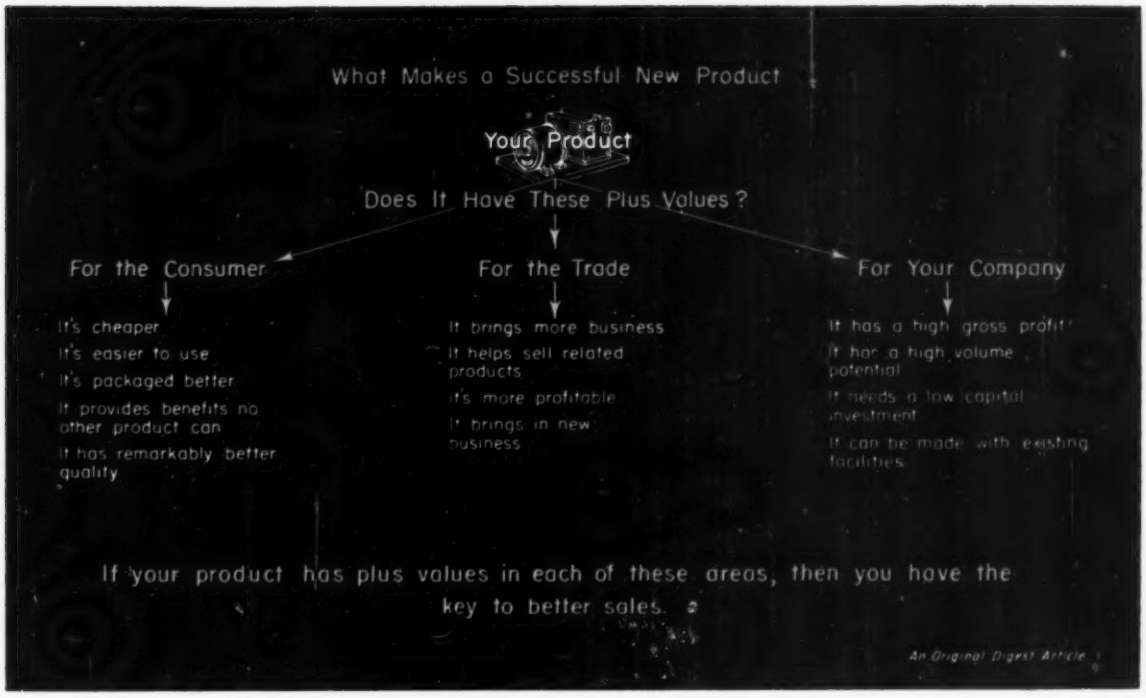
Price + Quality = Sales

Your product will be expected to "sell" itself; agents and importers will not, for the most part, be expected to sell your merchandise for you. This means your goods must be competitive as to both price and quality.

If abundant skilled labor is available to you, it may afford an excellent talking point for your merchandise. The Warfdale high-fidelity speaker, for example, is highly regarded in the U. S. market. One of the claims to quality of this British manufacturer is that he personally inspects every unit produced.

Finally, a sales follow-up program is almost mandatory. Producers vie with each other for the most "strategic" sales locations in stores and shops. To insure that your product gets fair treatment, you or your representative should personally check your sales problems from mark-up to sales.

Remember: if the product you offer is priced competitively, and is well-presented, there will be no buyer discrimination against it because it is foreign-made. On the other hand, you can be sure it will not sell merely because it *is* foreign-made.


What Makes a Successful New Product
Your Product
Does It Have These Plus Values?
For the Consumer
It's cheaper
It's easier to use
It's packaged better
It provides benefits no other product can
It has remarkably better quality
For the Trade
It brings more business
It helps sell related products
It's more profitable
It brings in new business
For Your Company
It has a high gross profit
It has a high volume potential
It needs a low capital investment
It can be made with existing facilities
If your product has plus values in each of these areas, then you have the key to better sales.
An Original Digest Article

New Products Build Business

IN THE U. S., it's rumored that the big automobile companies are making plans to introduce their new models late in the summer or early this autumn if sales of 1954 models are not satisfactory. Some of the models may be radically new—designed to make last year's automobile look far out of date.

What the automobile people plan to do can also be expected in other industries that make consumer durables. So, late 1954 may see the greatest burst of radically new designs in appliances, furniture, and automobiles that the U. S. has ever had.

Businessmen feel that new products, or redesigned old ones, hold part of the answer to getting better sales. And what is important to you, new products can do the same for business the world over.

One of your most potent weapons in entering any market is your product. If you have the right product in the right package with the right name, your selling job is made easier. But what makes a right product? C. Olivetti & Co., Ivrea, Italy, has some good ideas on this subject. Its office equipment enjoys a world-wide reputation for quality. Here's what it builds into its products:

- Simple operation needing little maintenance and offering long life.
- Functional qualities emphasized by attractive shape and color. Colors for one of Olivetti's products were carefully studied until a color was found that would blend with the interior of any office.
- A feeling of individuality and personality that makes it different from similar products on the market.

Backing up its products, Olivetti has a strong organization. Its purpose: to introduce and market Olivetti products and to keep close contact with customers after they are sold.

One way to better sales by means of better products is through a product research and development program. Such a program can benefit you in many ways.

Competition is increasing among larger companies. And smaller companies aim at continued growth. That means a need for better research and development. Many a company has said that, if it discontinued its research program, it would be out of business in a few years. So, a sound program can insure your company's future—new and better products will always be ready for marketing.

But what makes a sound product research and development program? First of all, top-level management must be responsible for the success of the program. Then the program should break down into four major divisions:

- **The formulation period.** Here, all elements of the program should

Two Ways to Better New Products

If you have a small company, you may want to hire an outside agency for your product design. Lippincott & Margulies, Inc., is perhaps typical of organizations that specialize in product design.

Lippincott & Margulies bring to your particular problem a staff consisting of capable creative and engineering talent—the kind of staff that would be hard for most companies to maintain unless they were continually developing new products.

Its product design section will take your new product from the basic idea, through a prototype, and into the early production stage. More than just a cover for your product will be studied and designed. In one case, Lippincott & Margulies designed machinery to do a better job of manufacturing a product.

If packaging is your problem, an outside agency again may be best for you. Here's how the agencies operate: you bring to them your product, tell them all about it— what it is, its market, where it will be used, how it will be used, how it will be advertised and promoted, how it will be sold, what facilities you have for making the package. The agency takes it from there. It considers all factors and produces a sample package for approval and testing.

American Machine & Foundry Co. has what might be called a captive product-design and development group in contrast to the independent Lippincott & Margulies. At AMF, a three-man team is responsible. Its job is to screen ideas that come from both outside and inside the company. All ideas are studied critically with these things in mind: (1) legal angles, (2) markets, (3) do they fit into AMF's production set up. Along the line, top management is brought in and takes an active part in the study. When an idea passes these tests, it goes on to engineering where it goes into the design stage.

be evaluated. More than half of all new-product failures occur because a proper predevelopment study was not made.

• **The determination period.** All elements should be studied, checked, and tested to provide a guide for the design program.

• **The design period.** All creative design is reduced to tangible layouts and descriptions and finally into detailed working drawings and specifications.

• **The follow-through period.** Here the product should be followed from engineering through shop, assembly, trial test, and trial production.

The object of the formulation phase is to give the program staff a clearly defined start. Policy is set here and management describes what it wants and expects. Reference material is gathered; economic factors are discussed; and costs are agreed upon.

In the determination period, areas of investigation are defined. This requires decisions as to what new elements or mechanisms have proved themselves in other fields and can be adapted to the present problem. It also requires investigations of components having experimental or unknown features.

In the design period, initial layouts are drawn into construction specifications. Then they are submitted to management for final study and approval. Working drawings are made, and the product goes to the manufacturing stage.

The follow-through period is essential to assure smooth handling of the specifications. Failure to provide for design engineering guidance in the manufacturing stage usually results in changes that affect design, accuracy, and purpose, as well as cost.

One company had this experience with its product research and development program. Its research chemist approached the company's president with this proposition, "With $25,000 I can develop a synthetic camphor." The president answered, "Fine, you develop a synthetic and we will develop a market for it." When the product was ready, there was no market. But the $25,000 was not wasted. Along the way the chemist had discovered how to make camphene—and a ready market existed. Now the company has recovered its initial investment many times over.

The point is this: only with research and development can a company be sure of a steady flow of products that will keep it ahead of its field. In this case, even though management went astray, research had come up with a product that could make money.

If you make consumer products, the key to planning new products is finding out what consumers want and then giving it to them. There is no positive answer to what people want, but a research and development program should reflect and anticipate:

• The needs and possible changes in habits of consumers.

• Changing market conditions.

• The developments of competitors.

• The competitive marketing and profit needs of the company.

These are broad goals that define the result product research and development should have. General Mills, Inc., essentially a flour miller, approaches the problem this way. It charts the essential facts about its industry and its products. Then, working from these facts, it explores the markets, the competition, the consumer demand. These studies point the way to new or improved products.

A project usually gets underway through joint planning conferences with its technical research people. Conferences are followed up by talks with management groups from its operating divisions. In this way, the development group assembles its facts so that it can take to top management meaningful programs and ask

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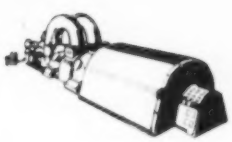
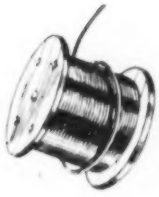


Electric Power Station & Sub-Station

Rolling-Stock



Wires & Cables

Telephones & Switchboards

Electric Tools

Malleable Iron Castings

Hitachi, Ltd.

Tokio, Japón

"Set Up a checklist . . . to evaluate a new idea."

for its support, guidance, and approval.

General Mills also has a check list of questions that are used to evaluate a new idea. The questions read like this:

- Will the proposed product improve the competitive and profit position of its sponsoring department?
- Is the product suitable for General Mills merchandising?
- Can the company use existing engineering, manufacturing and marketing organizations and facilities?
- What will be the probable total cost of developing, testing, tooling, manufacturing?
- What are the seasonal aspects of producing and marketing?
- Does the product have consumer appeal and how does it rate against standards of performance among users?
- Can the company equal or exceed existing competitive products in performance, use-advantages, volume, trade, and consumer appeal?
- What will be the effects on gross and net profits if this product is marketed?

These questions should also have satisfactory answers: (1) does the product offer a new service or a new experience to the consumer, (2) is its quality high, (3) does it have sufficiently large sales potential, (4) will it increase consumer satisfaction, (5) can it be backed with a sound promotional plan.

Once the new product has been developed and it has proven successful, your work is still not finished. Products are preferred by consumers for one or more reasons: (1) better function, (2) lower price, (3) more pleasing appearance, (4) simpler maintenance, and (5) longer life. These factors determine the success of a company's product. And you will constantly have to analyze them if you wish to keep your lead.

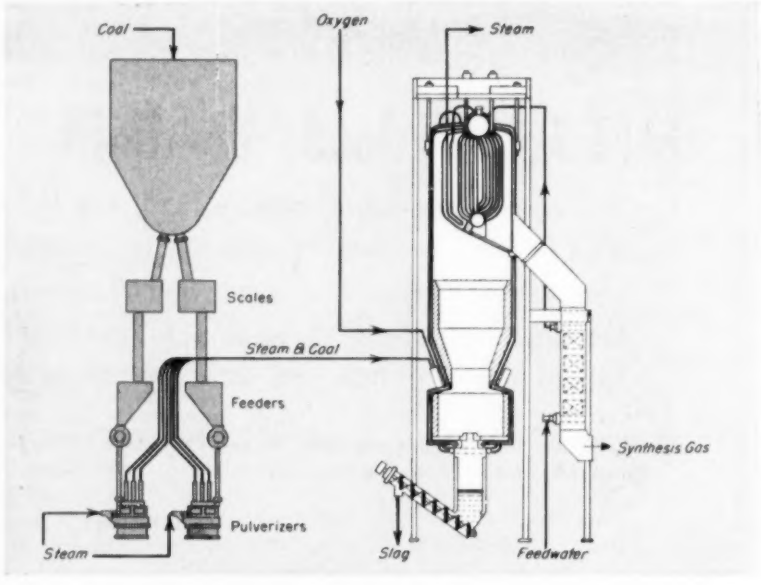
The best research and development program cannot mean much without ideas for new products. They can come from many sources. Your sales staff should be alerted for new-product ideas and ways of improving present products. Good ideas can come in from material suppliers, consumer complaints and suggestions, and surveys among product users. Industry is always faced with new problems. A study of these problems could lead to ideas for new products that could help solve these problems.

Specific checklists fitted to your particular product interests could be charted. Such charts give more details concerning the sources to be consulted. And they could serve to alert and educate your entire staff as to how and where to look for profitable product ideas.

Most large companies have their own staffs to design a product and handle market surveys. But smaller companies may have to rely on outside agencies. Management engineers, industrial consultants, market research agencies, advertising agencies, and industrial designers can carry out special studies, material and product tests, consumer surveys, and trouble-shooting jobs at all stages of a complex product-development job.

If you call in an industrial designer, decide on objectives for the new product. Let the designer know what is wanted and why. The designer should get your full confidence. Let the designer select materials. He is a materials expert and will use current inventory and facilities as fully as possible. And do not select a design because you like it. The designer works to please prospective customers.

Any one of the approaches to product development and research outlined above may fit your needs. Through them, alert management can be certain that its company will grow and contribute to the growth of the community.



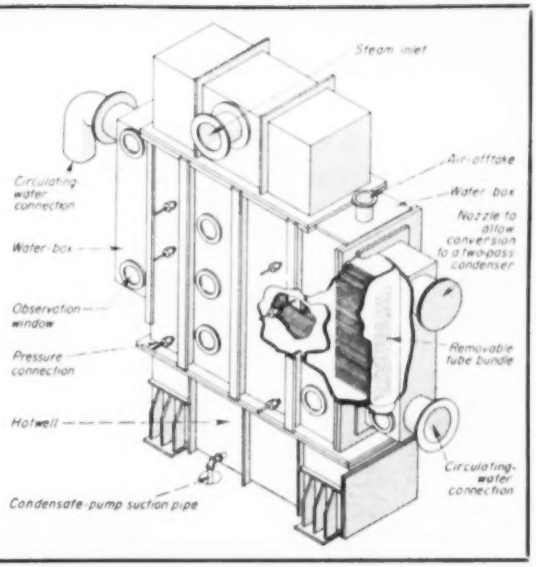
Synthesis-Gas Process Commercialized

Late this year, E. I. du Pont de Nemours & Co., Inc., will complete its Belle, W. Va., plant for commercial production of synthesis gas (McG-H Digest, Aug '53, p33). The process, known as coal partial combustion, will replace costly coke ovens and water-gas generators. Pulverized coal will burn in an atmosphere of steam and oxygen in a two-chamber furnace. Product will be synthesis gas composed of 40% hydrogen, 40% carbon monoxide, 15% carbon dioxide, 1% methane, and 4% inert material. Plant designer, Babcock & Wilcox Co., expects the full-scale gasifier to operate with a heat loss to the walls of about 200 Btu. per lb. of coal. Rated capacity will be 17 tons of coal per hr.—Chem Eng, Mar, p114

Experimental Condensers

The trend in power-plant design is toward higher steam pressures and larger units. To meet this challenge, engineers are employing a combination of basic research and field-test data for developing improved surface-type steam condensers. The greatest contribution to improved design comes from field-test data, but design changes for test purposes are usually prohibitive because of costs.

Allis-Chalmers Mfg. Co. has built an experimental condenser to solve this problem. The entire tube bank can be removed to permit changes in tube sizes, spacing, or material. Internal baffles are easily changed to suit various conditions. Glass-covered portholes permit visual inspection of the inside of the condenser.—Power, Feb, p108



Transition Engineering Develops New Products

Industrial research departments often come up with new products that look promising but never appear on the market. Most likely, the trouble is that the company does not have the specialized engineering talent required to translate the laboratory model into mass production.

To close this gap between research and production, Cambridge Corp. has developed a new technique called transition engineering—a process that nurses the hand-built product to the point where it can fit into a mass-production program. It has three phases:

• **Manufacturing Design**—A product is usually brought in as a drawing or prototype. Costs are then estimated to bring the product to a particular stage of development. The company puts its know-how to work finding production short-cuts until it comes up with a practical design that meets specified requirements.

• **Limited Production**—Designs are then tested and a limited number are produced. By this time, which may be 3 months after the product was brought in, materials and tools have been selected, production bugs worked out.

• **Installation**—Cambridge Corp. carries the plant layout to the product contractor's plant, gets him set up for production, trains his people, and turns the operation over to him. Or Cambridge Corp. may arrange to manufacture the product or parts of it.—Business Wk, Jan 23, p74

How To Cut Factory Cost

A new welded one-story factory, designed by R. W. Jones of Philadelphia, has glass running around nearly all its perimeter. No ugly columns impede vision.

Wall supports are light-walled 3½-in. steel pipes. They are welded to window-sash members whenever an intersection occurs. The pipes are located on 14-ft. centers along side walls but are spaced closer along the curved front of the building.

The building has no projecting wall columns or pilasters. This simplified construction of the 8-in. thick reinforced concrete side walls and lowered the cost. Along the side walls, 6-in. lally columns separate the sections. Columns are pipe instead of the usual I-beams.

Welding was done wherever possible. This, combined with the design, kept costs down to $6 per sq. ft. for the 73x184-ft. building. A comparable conventional building would cost about twice as much on the basis of cost per square foot.—Weld Eng, Mar, p28

Programming Promises Batch-Lot Automation

Automatic control of machine tools with programming devices is increasing in Europe. The reasons: to raise productivity, save labor, cut production costs. Their use bridges the gap between mass production machines and general-purpose conventional machines. They add a new approach to batch production.

One such machine has just been announced by Maschinen und Geratebau G.m.b.H., Berlin. It is a milling machine with a programming device that cycles the machine automatically.

The device consists of a metal tape attached to the front of the machine table. Holes punched in the tape govern the table movements. Feelers in a control box enter the holes, as the table moves along, and operate switches controlling the electromagnetic clutches.

When the job is set up the first time, the tape is punched. Thereafter, it controls the cycle—rapid traverse to feed, automatic lowering of table after feed traverse, rapid table return, raising the table, stopping the machine. After the first run, the tape is removed from the miller and stored as part of the tool equipment for the job.—Mach, Feb 27, p376; Mar 6, p43

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Eye-Safety Service

. . . brings unusual concepts to plant's safety program. Corrective glasses are fitted to the job only

THE HIGH ACCIDENT RATE in the sheet-metal fabricating, etching and finishing industry caused Etched Products Corp., Long Island City, N. Y., to adopt an eye-safety program.

Management was primarily interested in safety goggles. But the plant-safety director insisted on a complete optometric service, providing continuous care for the safety glasses and visual requirements of the employees. Essential requirements of this service are: (1) protective and preventive measures against industrial hazards, (2) visual corrections for optimum efficiency, and (3) advice to management on conditions affecting vision peculiar to specialized jobs.

The first step was to observe the men on the job. Actual plant conditions are completely different from other activities. The plant cannot put in a wholly new lighting system at the suggestion of the optometrist. Employees referred by the plant must be given corrections for the working distances.

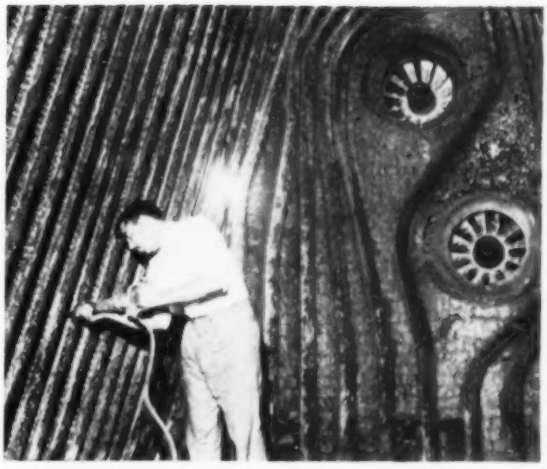
The second step was to test visual skills to determine efficiency under habitual conditions of seeing. The optometrists' offices or the factory must be equipped with test batteries for visual skills: hand and eye coordination, depth perception, near-point acuity, phorias, glare tests, color discrimination, visual fatigue.

Each employee in the tested departments was then examined to provide corrective and protective eyewear. Prescriptions were fitted to the exact job requirements.

As protective eyewear may have different corrections from regular glasses owned by the patient, the safety glasses should remain in the plant at all times to avoid loss or misuse. Servicing the glasses is an integral part of the program.

Program findings indicate conclusively that a prescription arrived at without knowledge of the job is not adequate for industrial use.—Optical Journ-Rev, Feb 1, p36

This Month's How To . . .



. . . spray chrome-base refractory

To apply chrome-base castable refractory to sheet-tube boiler walls, the old material is removed from sheet-tube waterwalls with an air hammer.

The chrome-base mixture is then sprayed in a thin-slurry form evenly over tubes and anchored in studs on side of the tubes so that they are evenly coated.

The chrome-base material is then usually cured by spraying water onto the exposed surface 4 hr. after material has been applied. This is repeated three times at 4-hr. intervals. In emergency, the unit may be put into service 12 hr. after coating, but that reduces refractory life.—Power, Mar, p140

. . . type three forms at the same time

Two typists at Highway Casualty Co., Chicago, now type the same number of policies formerly handled by five typists. A series of typewriters, operated automatically, account for the rise in output.

Called "Copy-Typist" equipment and made by American Automatic Typewriter Co., the unit operates three typewriters simultaneously. One typist has three typewriters responding to the touch of her fingers. She types the policy in the center machine. The machine on her right types the invoice, and the machine on her left prepares the identification card. Each machine can be operated independently.

Both auxiliary machines use continuous forms. The only inserting the operator does is on the master machine; here she inserts the policy.—Am Business, Feb, p22

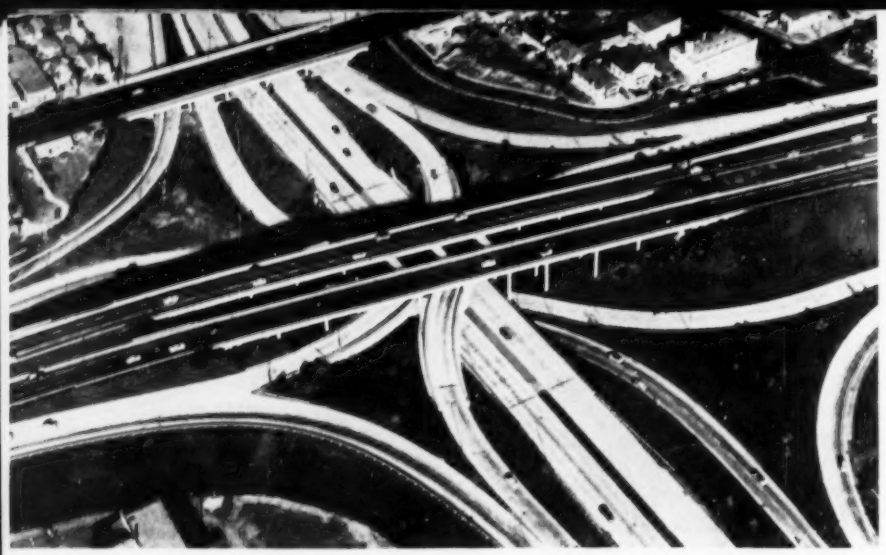
. . . cut waste with cost-board

Plant workers, like people in general, are sometimes wasteful of things considered of small value. Small tools, goggles, brooms are frequently lost or mislaid.

To impress upon workers the value of such items, Converted Rice Co., Houston, Tex., has resorted to the use of cost display boards.

The boards are made of 4 x 6-ft. plywood. The plywood was painted a light color. Several small items were permanently mounted on it with fasteners and the cost of each item was prominently stenciled below the item.

To avoid loss of effectiveness, the displays were altered in design and presentation periodically.—Food Eng, Mar, p5



Out of one of the U. S. biggest industries have come many trends and techniques. Some of those trends and techniques as reported in Engineering News-Record are presented here

Construction Trends for 1954

THE YEAR 1953 saw the U. S. construction industry face a difficult transition—from vast capital expenditures for defense to an increase in investments for peacetime living. To the problem, construction brought these assets: (1) a collective mind constantly enriched by new knowledge, (2) a reservoir of manpower educated to the use of mechanical skills, (3) a supply of materials ceaselessly under expansion, (4) machines continuously being improved. For today, these are the trends:

Buildings and Housing

Record construction volume has fostered a new type of thinking and new design techniques

Last year a definite trend appeared that showed a new type of thinking was being brought to the design of industrial plants. Management is primarily concerned with better labor conditions. Also, management recognizes the need for maximum flexibility in plant arrangements because of the ever-changing nature of manufacturing techniques.

Most new industrial buildings are one-story high, flat-topped boxes. Roof monitors are less obvious. Less side-wall sash is being used, sometimes entirely omitted, in line with a trend toward air conditioning and better lighting. There is also a trend toward less masonry, but more steel, aluminum and precast concrete wall panels.

Height of one-story factories and bay dimensions appear to be getting larger. New large plants are being built away from industrial centers. At the same time, there appeared to be a tendency for smaller plants to remain near those centers.

In the construction of tall office buildings, the most significant trends were those toward greater use of air conditioning and metal panels for exteriors. In addition to aluminum and stainless steel, porcelain-enameled steel facings appeared to be making headway in 1953. Metal panels are growing in popularity because they speed up construction, cut maintenance costs, and weigh less than masonry.

The trend toward air conditioning of office buildings took a surprising upturn last year. While air conditioning was installed in most major new structures, a large number of existing buildings began to add it last year. Also, there appeared to be a trend toward air conditioning of new homes.

Another noteworthy trend in office-building construction resulted from the introduction last year of a completely automatic elevator system. Without an operator, the new system coordinates the movement of each car in a bank of elevators with the operation of the other cars.

To meet the demand for larger and larger floor areas unobstructed by columns, and yet to keep costs down, engineers tried several new techniques. With these, they set span records last year for certain types of steel, aluminum, timber and concrete construction.

Timber trusses for a Westchester County Airport hangar had top and bottom chords made of single, glued laminated members. The one-piece web members were connected to the chords through steel plates, by means of shear connectors and bolts.

Use of precast and prestressed concrete members is on the rise. The lift-slab method also made headway last year. Tallest structure built to date is a six-story nurses' residence in Canada.—p86

River Control

Pumped storage and stored water highlighted last year's river control and use progress

There were few major floods in the U. S. last year. But there was widespread drought throughout the summer and fall. So a little-recog-

nized purpose of control structures was made very apparent: storage dams eased the drought.

Last year, 75% of the Missouri River's flow at Omaha and other key points came from reservoir storage. Throughout the southwest, multipurpose dams of the U. S. Corps of Engineers were operated to meet water supply and irrigation needs, as much as power loads would allow. Future river use and control projects seem due to be planned with more emphasis on the supply phase of multiuse projects.

In the hydroelectric power field, pumped storage and reversible pump-turbine units are gaining increased acceptance. Ontario Hydro plans pumped storage on the Canadian side of Niagara Falls; pumped storage figured in early plans for the U. S. side.

In Austria, the Reisseck project near the Yugoslav border will have a 5,800-ft. head, highest of any hydro installation in the world. Water will be pumped to storage from an intermediate level.

An improved means of exploring foundation material developed last year with successful field tests of a bore-hole camera at Folsom Dam, Calif. The device can be lowered into a 3-in. hole to record on film a series of 360° views of the material under investigation. Each color-film exposure covers a ¾-in. vertical section of hole.—p102

Transportation

Highway fatalities and toll collections are just two problems faced by highway engineers

Pressure from vehicular traffic continued to be the primary stimulus to construction in the transportation field during 1953. There was a phenomenal increase in toll-road projects. Free-road and bridge-contract money about equaled that for toll roads. But road construction will have to proceed at twice its present rate to close the gap between today's facilities and traffic demands.

During 1953, the accident death rate on turnpikes was carefully watched. Toll roads have become spectacular offenders. This is not because their fatality rate was higher than national averages but because more safety was supposed to have been built into these highways.

The most logical reason for turnpike accident severity has seemed to be the high speed that is allowed and maintained. Speed is a principal attraction to revenue-paying traffic, and for that reason the authorities hesitate to reduce limits until they are sure there is no other way of reducing fatal accidents.

Seeking evidence that might either indict or exonerate high speed, the Pennsylvania Turnpike Commission last year reduced speed limits on the western half of its turnpike, while leaving the maximum passenger-car speed on the eastern half at 70 mi. per hr. No results have been announced.

Meanwhile, the New Jersey Turnpike Authority reported that deaths had dropped from 47 in 1952 to 36 in 1953, despite a 20% increase in traffic. Turnpike police attribute the reduction to strict enforcement of existing traffic regulations.

Another turnpike problem received some attention during the year. Toll collection promised to be the most complex yet on the New York Thruway because of temptations for collectors to cheat. Motorists will be able to pay tolls in three different ways; (1) by cash-fare ticket, (2) by charge accounts for commercial operators, and (3) by a flat-rate annual permit for New York-registered passenger cars.

Moreover, the toll road will have more toll-collection interchanges than any previous route. Precautions against cheating have gone so far as to include a camera that can photograph every transaction and vehicle as it passes through a toll-collection gate.

There were other problems and solutions, too. In concrete paving, one advance in construction technique seemed ready for growing adoption. It was formless concrete placement. In 1953, several techniques were tried on Illinois projects.

The most promising machine there consisted of a crawler-driven frame that mounted two screeds and a vibratory unit. The frame also carried side-forms 30-ft. long, which acted as slip forms. Concrete from a regular paver was fed onto the subgrade ahead of the new machine, and a slab 24-ft. wide, free of side slumpage, emerged from the forms' trailing edges.

Crack control continued to get attention during the year. On several projects in various parts of the country, sawed contraction joints have been specified.—p122

Sanitation

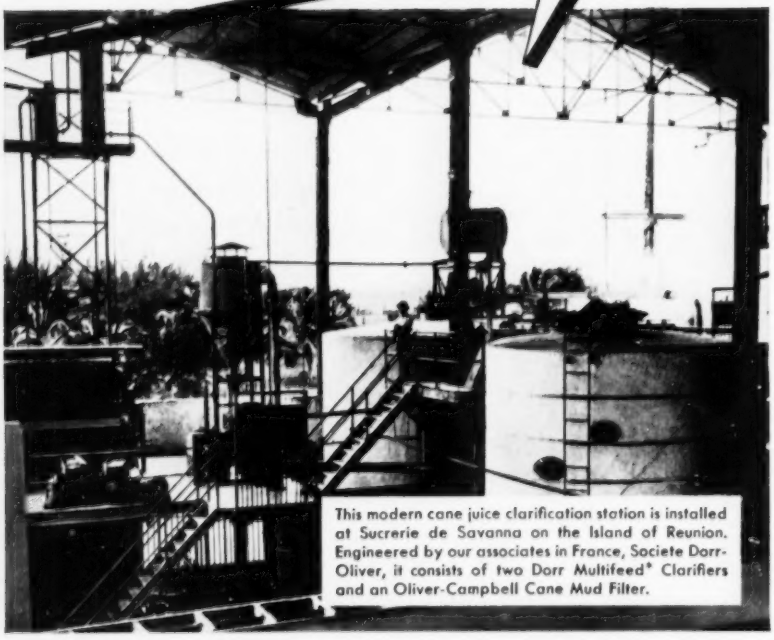
The drive is toward lower costs in sewage disposal. Progress is made on several fronts

Population growth kept demanding waterworks; regulations and public opinion demanded sewerage. Sewage disposal plants being built to do the needed job on cities' sewage are generally of standard, conservative design. The trend is toward more secondary treatment, more chlorination of effluent, more trickling-filter installations, plus growth of the activated-sludge process in all its modifications.

There was some new thinking on the problem of sewage sludge disposal. Where sludge production is large, its disposal can be a major cost item. Three efforts are being made to cut the cost of sludge disposal:

- In the Pittsburgh, Pa., area a primary treatment works has been designed that will concentrate its sludge by flotation to a product of 20% solids, dry enough to incinerate economically.
- The Bowery Bay plant in New York City thickens its sludge to one-third its normal volume. Effects claimed include high-rate digestion in one-quarter the usual space, plus elimination of need for secondary digestion.
- Two independent efforts to improve digester efficiency have proved that recirculation of digester gas can aid the process. On the basis of pilot-scale tests, recirculation of gases has been credited with cutting digestion time to one third normal.—Eng News-Rec, Feb 18, p140

Satisfaction for your sweet tooth starts here



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Moving Television Sets by Automatic Machine

Sealing the bottom of television receiver cartons that weigh as much as 350 lb. with an automatic turning machine resulted in an annual savings of $24,000. The combination electric and pneumatic turnover machine was developed by the Olympic Radio and Television, Inc., of Long Island City, N. Y.

The television receiver reaches the cabinet department on a roller conveyor. A carton is pushed down over the cabinet, with the bottom flaps open. Cabinet with carton is then rolled onto the first section of the turnover machine. Operation of an air valve rotates the carton 90° so that the cabinet is lying on its side on five parallel pipes.

Four interleaving pipes on the next turnover section now pick up the carton and turn it onto a conveyor belt driven by an electric motor. When the roller belt conveyor has reached its horizontal position, the electric motor starts automatically and moves the carton onto the continuation of the roller conveyor. The bottom of the carton is now sealed conventionally to complete the packing job.—Electronics, Mar, p264

Woven Glass Roving

New woven glass roving provides highest strength and bulk in plastic reinforcements at a cost close to that of glass mat. Made by Strandcote Corp., the material is called Glastrand. It is made up of standard untwisted glass rovings. This feature permits better penetration of impregnating resins.

The fabric is available in a weight range of 13 to 52 oz. per sq. yd. Standard weaves are 0.019 to 0.085 in. thick. Laminates have achieved flexural strengths up to 91,750 lb. per sq. in.

The manufacturer believes that the new material will open many new fields in plastics reinforcements where high strength, bulk, and uniformity of distribution of the glass is required at a lower pound price than other woven reinforcement materials.—Mod Plastics, Feb, p95

Measuring Recession

Here are the most important causes of the U.S. business slump and what the slump means for the immediate future of your exports to the U. S.

THE CURRENT RECESSION in U. S. business is now a well established fact. (McG-H Digest, Apr, p7). But what are the measures of that recession and what does it mean abroad?

To date, the downward trend has been termed an inventory recession. There is, however, an important distinction in this case between inventory correction due to natural forces and the correction due to artificial forces; namely, reduced government spending.

The peak of national security spending ($54-billion) in the second quarter (April-June) of 1953 coincided closely with the peak of sales of those industries most directly and intimately connected with the U.S. defense program. Inventory peaks occurred three to six months later.

The inventories of these industries began to decline in the third and fourth quarters in 1953. In substantial part, then, the inventory correction in these defense industries is a readjustment to the lower level of national security spending.

The exact proportion of inventory correction cannot be computed, but it is estimated that for manufacturing alone the correction due to defense cuts is about one-third the total. National security spending for 1954 will continue at around $47-billion or $6-billion below the '53 level.

Normal inventory reductions, on the other hand, have been cut to more satisfactory levels. The inventory liquidation to date is enough to account for most of the decline in production and the upturn in unemployment. But the correcting still has a long way to go. Manufacturers inventories, which reached a peak of $47.1-billion in September, had declined only $700-million through January.

Similarly, retail stocks had declined only $400-million from the high point last year. This stems from the fact that sales, which began sliding while business was still piling up, had declined up to that time even faster than inventories. There is a big imbalance between sales and stocks. But the fact that inventories are now being cut as sales decline suggests that stocks, in relation to sales, can be brought into balance fairly soon. The key questions will be answered by the customers.

A partial answer to what the customers intend to do was recently provided by the Federal Reserve Board's annual survey of consumer buying intentions:

This year . . .	Last year . . .
6.8% plan to buy houses	8.8%
7.8% plan to buy autos	9.0%
6.2% plan to buy used autos	6.2%
26.8% plan to buy furniture and major appliances	31.9%

This reluctance to splurge at the 1953 rate reflects increasing doubt among consumers about their chances of improved incomes in the coming year.

The survey also reports a decline in present earnings. In early 1953, 16% said they were making less than a year ago; this year 23%. A year ago, 48% reported higher incomes than they were making a year earlier; this year, only 41% reported higher earnings. There was also a tendency on the part of the consumers to place their buying intentions later in the year than previous surveys have shown.

Consumers seem to think that 1954 is going to be a good time to buy—in spite of their doubts about reduced income. But they expect prices to be lower than in 1953.

The decline in business activity has also taken some of the buoyancy out of industry's plans for capital investment. According to the Department of Commerce, businessmen will be investing 4% less in capital equipment than they did last year. This slight decline will still leave a good $27.25-billion for capital spending—enough to serve as a powerful force in business. However, it is clear that this year, capital spending will not be acting as a powerful force for spending.

What does this mean in terms of U.S. imports? The level of national income is probably the most important single determining factor of the level of U.S. imports. From 1950 to 1953, the U.S. imported roughly $36-million of goods for every $1-billion of national income. In terms of estimated 1954 national income, that means a level of imports of $10.4-billion or roughly $600-million below 1953—a decline of 6%. Certainly one cannot call this level catastrophic.—Business Wk, Mar 13, p28; Mar 20, p25

Electrostatic Detearing Improves Dip Coatings

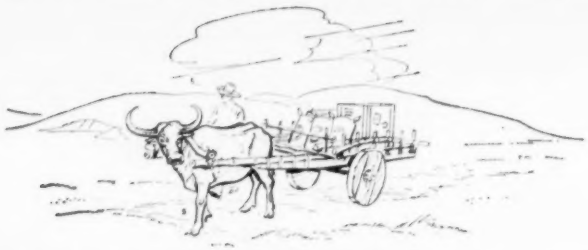
Smooth, uniform painted finishes on dipped parts are the result of electrostatic detearing. It's a new process developed by Ransburg Electro-Coating Corp., Indianapolis, Ind., to remove the tear drops and fatty edges that form at drain points of dipped articles.

An article, after normal draining, is exposed to a special electrode arrangement maintained at a high voltage. The electrostatic field attracts and removes tears.

At the Midwest Plating & Chemical Corp., electrostatic detearing allowed the substitution of conveyorized dip painting for hand spraying. A change, either of process or an expansion in hand spraying, was required by greater production demands.

Previous rejections, with hand spraying, ran as high as 7 to 8%. With the new set-up, rejects have fallen to less than 1%. Further advantages gained include improved finish, 50% savings in labor, 60% savings in paint, and greater ease of control as fewer viscosity checks and adjustments are needed.—Iron Age, Feb 4, p153

ONE OF A SERIES SHOWING WILLYS VEHICLES AT WORK THROUGHOUT THE WORLD



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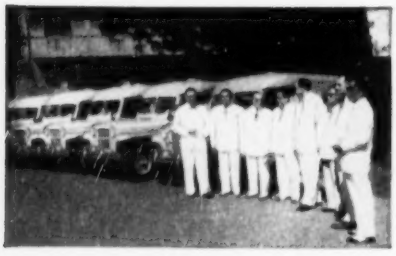
WILLYS SEDAN DELIVERY, with its unmatched economy of operation and maintenance, brings low-cost delivery service to one of Manila's largest bakeries.

ON SUGAR CANE PLANTATIONS, the 'Jeep' is a time-saver that transports supervisory staff members over cane fields and improvised paths to follow the various operations of cutting, loading and hauling. Here, a 'Jeep' equipped with 2-way-radio communication enables a field superintendent to report to the mill office on progress of cutting.



WILLYS AMBULANCES travel on or off the road to transport the sick or injured. Above is part of a new fleet being delivered to the Bureau of Hospitals in Manila.

A 'JEEP' FIRE ENGINE serves the Civil Aeronautics Administration with low-cost and dependable fire protection at the Manila International Airport.

THE SECURITY GUARD of San Miguel Brewery relies on the "go-anywhere" ability of this 4-Wheel-Drive Willys Truck for rapid and *sure* transportation.

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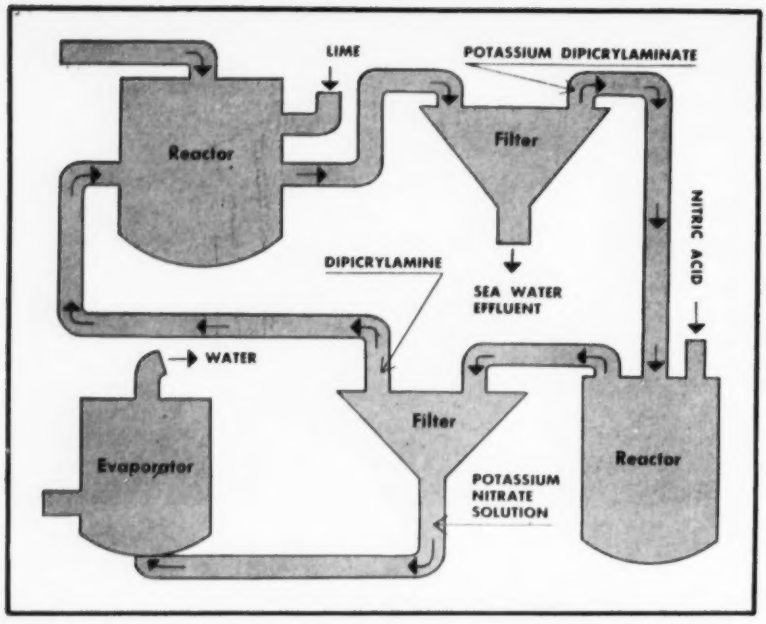
4-WHEEL-DRIVE WILLYS STATION WAGON

4-WHEEL-DRIVE WILLYS TRUCK

AERO WILLYS



FLOW CHART outlines the pilot-plant process that may lead to commercial . . .

Fertilizer from the Sea

The sea has long been dreamed of as the source of huge mineral deposits. One such dream is now coming true on the Dutch shore of the North Sea

BESIDES THE DREAMS, a lot of research has gone into the utilization of sea water. And it is expected to pay its way with a pilot plant newly built at Ijmuiden, Holland. The product will be potassium nitrate made from sea water and nitric acid.

The plant is a joint venture of Norway's Norsk Hydro and Holland's Mekog (Maatschappij tot Exploitatie van Kooksovengassen). It will make only 1,650 tons of potassium nitrate a year. But if the process succeeds, the pilot plant will be enlarged.

The companies hope eventually to meet the nitrate needs of both nations. In 1942, Norway imported 45,000 tons of potasium fertilizer and Holland 200,00 tons.

This plant marks the second attempt by Norsk Hydro to extract potassium from sea water. Before the war, it built a pilot plant (at Heroya, Norway), which later was destroyed by Allied bombing.

Process details have not been revealed. But processes have been patented in the U.S. and Canada by J. Kielland of Norsk Hydro and W. Fleischer. Fitting clues from the patent literature in with the little information released indicates the pilot plant will probably operate along these lines:

- Sea water will be passed through sand filters, then mixed with a soluble salt of dipicrylamine (probably the calcium salt, made from the dipicrylamine and lime).
- Potasium dipicrylaminate will form and precipitate, and be filtered off while the effluent will discharge back to the sea.
- Wet precipitate will be reacted with nitric acid to form highly soluble potassium nitrate and insoluble dipicrylamine. The acid not only will form the nitrate but also regenerate the expensive dipicrylamine.
- After another filtration, the dipicrylamine will be recycled to the first reactor and the nitrate solution evaporated to recover the potassium nitrate.

Not yet known is whether there are any temperature limitations on the reaction. As the potassium content of sea water is 1 lb. in 245 gal., the necessity for heating the water might push costs beyond economic bounds.—Chem Wk, Mar 13, p44

Aluminum Mine Cars Modernize Coal Mine

Part of the mine-modernization program of Dominion Coal Co. Ltd., Sidney, Nova Scotia, included installation of aluminum mine cars. Capacity of each car is 3 tons. Weight is 1,920 lb., compared to 3,750 lb. for the steel car previously used.

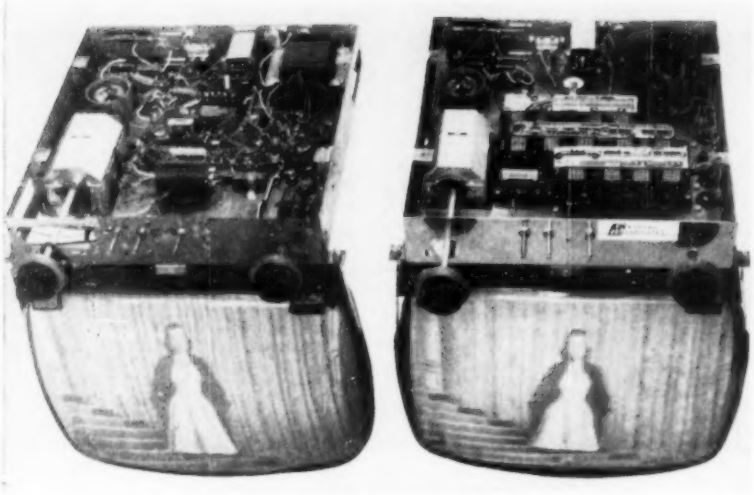
In addition to lightweight and resistance to wear and corrosion, the aluminum cars are self-cleaning and have high ability to absorb vibration. Consequently, splitting and tearing of the sheets after breaks occur are eliminated. But the aluminum is easily scarred or gouged and must be protected against rubbing because of its softness.

Cars have been under observation for 5½ years. Because of slightly acid mine water, steel members have been badly corroded, but the aluminum members are still in good shape. New cars are redesigned to use more aluminum in place of steel. —Coal Age, Mar, p175

Faster Heat Treating

Heat-treating knitting-machine cylinders in an electric furnace has increased production at Keller Machine Co. The removal of excess solder and metal particles from the rings through heating has also cut down on labor.

Twelve heating elements in the 1,000-watt furnace are used in any combination to obtain exact temperatures in a minmum of time. Peak temperature of 1600°F. can be reached in 45 min., compared with 2½ hr. required with gas furnaces. A bank of electric melting pots, each having two 1,500-watt heating elements, melts down metal from metal-coated machine parts.—Elec World, Feb 22, p152



TV Set Uses Tinkertoy Construction

Commercial application of the Tinkertoy modular-construction technique (McG-H Digest Dec '53, p38) to television receivers was recently demonstrated by Landers Associates Inc., Nashua, N. H. Using thirteen modular units on three plug-in printed circuit chassis, the technique eliminates almost all hand soldering. Specifications for tools required to set up production as well as drawings and an engineering handbook are now available to the industry from the Office of Technical Services, Department of Commerce, Washington 25, D. C.—Electronics, Feb, p6

Foremen Into Managers: Solved by IBM Program

A recent meeting of the American Management Association's Special Conference on Supervision heard how International Business Machines Corp. makes managers out of supervisors. The discussion got behind the foreman's job to dig into the philosophy of supervision in terms of today's problems.

IBM began its program by giving the foreman more authority and responsibility. It redefined his job in terms of a primary core of personnel responsibilities: hiring, training, promoting, organizing work, and looking after all those things that involve the worker and his job. IBM abolished the old title "foreman" and called them what it really wanted them to be, "managers."

IBM wanted each foreman to be like the owner of a small business—to be given the opportunity to run his own job. The whole project gave the supervisor more freedom of action—let him use his own judgment. At the same time, the foreman got more authority.

For results, IBM found that the most successful operations were those in which managers had an opportunity to solve their own operating problems; to make real management decisions; to work out schedules, costs, installation of engineering changes, and the like.—Am Business, Jan, p32

Glass-Fiber Cushioning

Resin-bonded glass fiber has a relatively new use—shock and vibration damping. Internal friction between fibers give it excellent damping properties. Other advantages it offers include negligible permanent set, resiliency, chemical inertness, moisture resistance, non-combustibility, and stability over a wide temperature range.

These properties make it suitable for vibration isolators in blowers and electronic gear, shock pads, heavy-machinery mountings, and protective packaging of delicate equipment.

Limitations of the material are its essentially uni-directional properties and its distinct yield point. Therefore, forces parallel to the plane of the sheet should be kept at a minimum and highly concentrated loads should be avoided. —Prod Eng, Feb, p166

GLOBE OiLIFT® speeds materials handling in a steel plant

The loading dock of an iron foundry is almost four feet higher than the floor level inside. What's more, fork trucks moving along the narrow dock must make a right angle turn to get through the plant doorway. A ramp couldn't solve the problem because it not only would take up too much room, but would leave unsolved the problem of making that sharp turn.

The foundry solved its problem by installing a Globe OiLIFT in which the hydraulically-powered steel platform is combined with an automatic rotating device. As the platform rises, it turns counter-clockwise in an arc of approximately 90 degrees to "aim" fork trucks down the outside length of the loading dock (upper photo). As the platform lowers, it rotates clockwise, so that at the lower plant-floor level the front of the truck is pointing through the doorway (lower photo).

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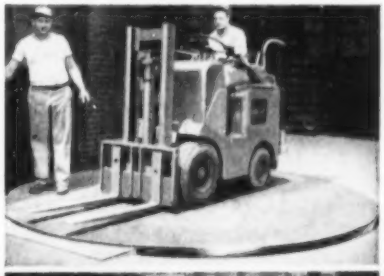

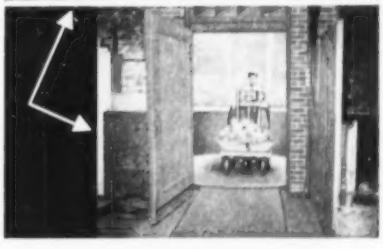

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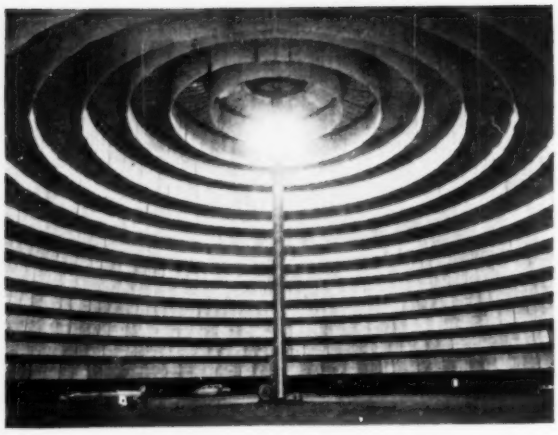


"Packaged" Aluminum Igloo Provides Huge Clear Space at Little Cost

Rising 85 ft. above the Texas plain at Longview is the new "Semispherical" building created by R. G. LeTourneau, Inc. The structure is 300 ft. in dia. at the base and offers 70,686 sq. ft. of unobstructed floor area at a cost of less than $4 per sq. ft. Production has started and similar buildings can be erected anywhere by shipping the prepared metal parts to the site. Semiskilled labor can handle erection. The semisphere is built from the top down, but the building work is all done on the ground. A central mast 94 ft. high is erected and may be removed or left in after construction is complete. A sliding steel collar, called the peak structure, is fastened to he center pole at a height convenient for construction at ground level. As successive rings of aluminum sheeting—15 in all—are bolted into place, the collar is raised by a winch. When the last ring is bolted on, the peak structure is 85 ft. up the center pole. The lower edge of the completed building is then secured.—Eng News-Rec, Mar 11, p101

New Industrial Uses For Wrought Iron

Fashions in engineering materials are unpredictable. Occasionally, an old material is rediscovered. This is true for wrought iron.

Wrought iron has long been at the bottom of U.S. metals production. U.S. production reached its peak in 1890. Annual production since has seldom been over 150,000 tons. During the 1930's the industry sometimes worked at only 10% of capacity. But since 1940 the industry has been working at full capacity.

One of its biggest boosts came from the architects. Wrought iron is traditionally specified by engineers or architects where there is a corrosive condition, combined with shock or vibration. The new uses follow the same pattern:

• **Radiant heating**—Wrought iron pipe is now widely used to form hot-water coils in the floor or ceiling of panel-heated homes. It has about the same expansion rate as concrete. It has corrosion resistance, a high rate of heat conductivity, and is easily bent.

• **Refrigeration** — Condensers, cooling coils, surge tanks are subjected to severe corrosion. Wrought iron pipe solves this problem.

When one mentions wrought iron, you usually think of garden furniture or ornamental railings. But wrought iron today is going utilitarian.—Business Wk, Mar 20, p85

Magnetic-Flux Welding

Simple nozzle adapter for a conventional semiautomatic, or squirt, welder permits deposition at extremely high speeds—even higher than those achieved by fully automatic welding heads. The process, developed by Stoody Co., combines squirt welding with Brown-Boveri automatic magnetic-flux welding process.

When electric current passes through the bare electrode (usually $\frac{1}{4}$ or $\frac{5}{32}$ in.), the magnetic field created causes magnetic flux in the hopper to coat the electrode. Permanent magnets in the nozzle adapter then act as a dam to the flow of flux whenever the arc is broken.

Deposition rates run from 8 to 20 lb. per hr., depending on the current. Weld deposits are sound and uniform. Flux consumption is low, usually in a 1:1 ratio with metal deposited.—Weld Eng, Feb, p57

Cafeteria Trains Serve 250 Meals per Minute

The long walk to the cafeteria and the long wait once he gets there have stopped many a worker from using his plant's cafeteria. One way to take the walk and wait out of luncheon is to put the cafeteria on wheels.

The Torrance plant of Douglas Aircraft's El Segundo Div. now has 12 cafeteria trains to serve a shift of 3,000 workers in 12 min. Supplied from a central kitchen, the food fleet fans out to areas near ten dining rooms. There, each three-cart train becomes a miniature cafeteria.

Douglas cites these advantages of its new mobile food service:

• Eliminates need for staggered lunch periods.

• Cuts personnel from four on a regular cafeteria line to one driver-cashier per train.

• Saves man-hours lost by employees.

• Eliminates dish washing. All utensils are disposable.

• It is flexible. Handling more employees means "additional carts, not additional cafeterias," Douglas points out.—Factory, Feb, p133

Mutual-Hiring Program Helps Small Companies

Many small companies in Los Angeles are getting the benefits of "big-company" personnel services without a single full-time personnel man on their payrolls. Their work forces range from 6 to 320 employees.

In 1949, seven companies founded the Mutual Employers Association. Since then, membership in this cooperative group has grown to 150 members, who gain these benefits:

• **Locating employees**—Newspaper advertisements, job bulletins to sources of labor supply, and direct referrals draw 2,000 to 2,500 applicants a month—a wider selection than any one of the companies could get alone.

• **Screening**—Trained personnel of the association screen out the misfits, thereby reducing turnover in member firms. Screening is done by preliminary interview, extensive testing according to job, and preparation of a detailed profile.

• **Money saving**—The average cost of hiring one worker in the Los Angeles area is $300. For members, it amounts to only $60. Members are assessed according to their size and the amount of work done for them—about 80¢ per month per regular employee plus a fixed fee for each new worker of $5 for lower job classifications to $35 for supervisory jobs.—Am Mach, Feb 1, p121

New Smelting Furnaces

Four electric smelting furnaces will go into production this summer to recover nickel from Oregon's low-grade ore. They have been designed by Bechtel Corp. and are being built by Pittsburgh Lectromelt Furnace Corp. for M. A. Hanna Co.

The four furnaces, 26 ft. in diameter, are equivalent in size to 200-ton steel furnaces and have 55-in. electrodes. They will operate at 15,000 kva. on a relatively low voltage because of low nickel concentration.

The furnaces will be used in conjunction with the French Perrin process. This process has been tried in France only on a pilot-plant scale.

Ore will be dried, put through a calciner at 1300° F., and smelted at 2700-2900° F. Molten ore will be transferred to ladles and ferrosilicon added. Agitation by pouring the metal from one ladle to another will help reduce molten nickel to ferronickel. End product will be pigs of 75% iron and 25% nickel.—Iron Age, Feb 25, p77

Reducing Vault Costs

A new preassembled transformer unit, called Power Pac Assembly by its maker, Pennsylvania Transformer Co., reduces vault installation costs. A standardized unit employing three or four standard transformer core-and-core assemblies provides three-phase or single- and three-phase service to customers.

Power connections are simplified as core-coil assemblies are interconnected at the factory. The installation of short lengths of primary cable from primary terminals at the plant eliminates the external primary bus and permits a completely metal-clad job for maximum safety.

Vault-size requirements are reduced. Two preassembled units can be placed in a vault that formerly contained a bank of single-phase transformers. Servicing requires little time and no inconvenience to the customer.—Elec World, Feb 22, p119

Belt Transports Coal

To feed the boilers of the Ohio Power Co.'s new 400,000-kw. plant in Ohio, Sollitt Construction Co. built a 4½-mi. rubber conveyor belt system that will carry a steady supply of coal from stripping mine to the power-plant's storage area.

The belt crosses backwoods roads, county highways, and a 500-ft. river. According to B. F. Goodrich Co. engineers, who fabricated the rubber belt, the coal will make the trip in less than 40 min.

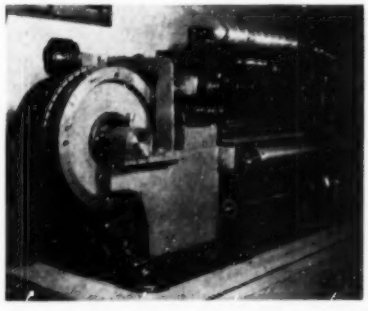
The system is composed of 14 flights ranging in length from 500 ft. to over a half-mile and will transport 800 tons per hr. The belt is 36 in. wide and is driven by 14 motors with a total capacity of 1,435 hp. At some points along the hilly trip, the belt must carry its load up a 12° incline.—Eng News-Rec, Jan 28, p29

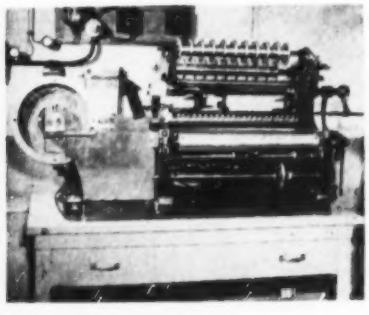
Stainless Substitute

Thermonol is a new alloy that can replace stainless steel in many applications. It was developed by U. S. Naval Ordnance.

The alloy consists of 84% iron and 16% aluminum. When vanadium or molybdenum is added in the order of about 5%, the alloy combines a surprising number of properties in one material.

Thermonol is 25% lighter than stainless steel and can be heated to 1300° C. with low heat losses. It has high resistance to corrosion and oxidation.— Am Mach, Mar 15, p182





Mill Extends Sample Tricot Designs

Unable to get enough designs from a sample-tricot machine with stud pattern wheels, Dover Mills, Shelby, N. C., attached a pattern-chain drum mechanism and can now make unlimited patterns. Sprocket (arrow) can be changed to get variable speeds of the pattern chain. Guide-bar mechanism has been modified so that the guide bar is pushed toward the pattern chain. Tension spring on guide bar was replaced with a compression spring for this motion.—Textile World, Mar, p125

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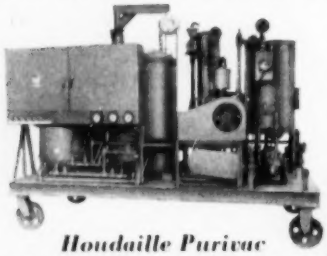

Houdaille Purivac

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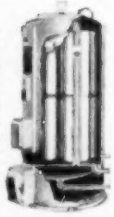

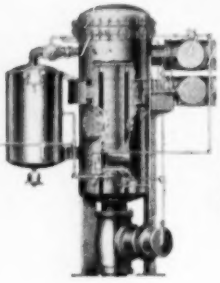

clarifiers

Automatic or mechanical units meet all filtering requirements of small or large central coolant systems. Remove abrasives and other solids from oils and coolants used in grinders, broaches, boring machines, etc.

Oil-Field Automation

Automatic control equipment being developed by Magnetic Industries, Inc., Houston, Texas, will find uses both in and outside the oil industry. Wired circuits or radio (frequency modulation) can operate the devices to open or close valves.

One device has an electric motor and gear train that actuate the valve stem. As the motor turns the gear train and opens the valve, it also winds a heavy-duty clock spring. In case of power failure, the spring closes the valve.

Remote control of oil-field installations will be possible with only moderate capital investment. It can release higher-priced day-by-day supervisory and operating personnel to other duties.

Possible applications will include control of natural flow, pumping units, secondary recovery, compressor stations, tank farms.—Oil & Gas J, Mar 8, p58

Low-Cost Insulation

Spraying its storage tanks with a lightweight mastic coating has cut application and maintenance costs of insulation for Sinclair Refining Co. The insulation reduces heat loss 50% for tankage containing liquids at temperatures up to 200°F.

The mastic coating used by Sinclair is Witcote No. 820 cork insulation made by Witco Chemical Co. It is sprayed on to ¼-in. thickness at a cost about half that for installation of fiber glass and aluminum sheet. Conventional block insulation costs even more than the new method.

Sinclair has coated 15 tanks with the mastic. Fuel-oil tanks were coated on the shell only, while other tanks have been coated on the roof as well.—Pet Proc, Feb, p245

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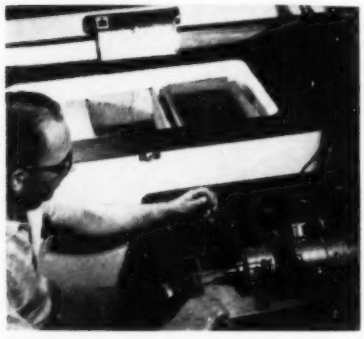
TECHNICAL SHORTS

Faster Handling—Portland (Ore.) Beer Distributors, Inc., have speeded up truck loading so one man can unload and load a truck in 15 min. The secret: (1) dividing truck body by pipe partitions into compartments for eight pallets, (2) sliding doors on sides and rear, and (3) loading by lift truck. —Food Eng, Feb, p131

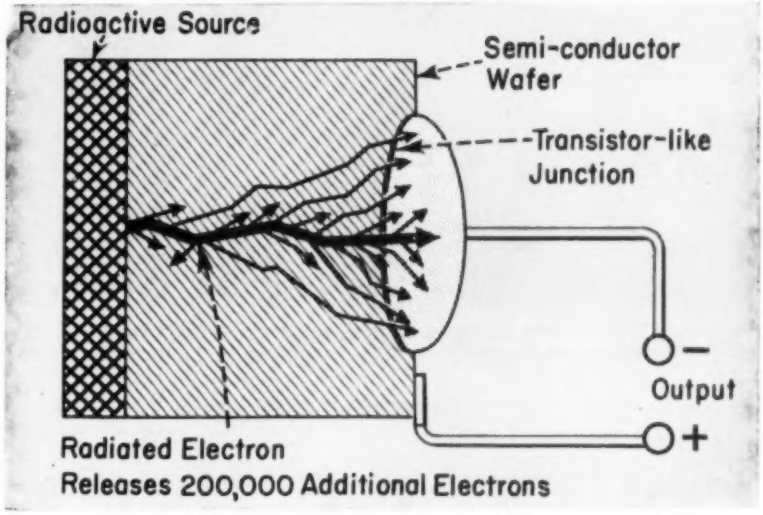
For Electrochemicals—A significant development for makers of electrochemicals is use of magnetic amplifiers in series to meter current in chlorine-caustic soda lines. Magnetic amplifiers isolate recording instruments from cell-line bus bars and avoid cost of installing a large shunt in the main bus. Over-all result is cheaper production.—Chem Eng, Mar, p110

Uses for Polyester Film—Du Pont's new Mylar polyester film can be used as a base for metallic yarn, a supporting yarn, a surfacing material for metallizing and fabric laminations, a leader material for dyeing and finishing operations, and for other textile applications. It will not dry out or become embrittled with age.—Textile World, Mar, p242



Helps Drill Plastic

Drilling small thermoplastic knobs meant too many rejects for Astatic Corp. Drills heated up and chips clogged in holes. Now firm chills knobs to 0°F. in a home freezer. There are few chips and little grabbing of the drill. Freezer saves 28 man-hr. a day at $1.40 per hr. It paid for itself in 8 days.—Factory, Mar, p132



Atomic Battery Converts Energy Directly

Radio Corp. of America, late in January, announced an atomic battery that converts nuclear energy directly into electricity. With battery power only 1-millionth of a watt, years of development work lie ahead. Efficiency so far is only 1%. The battery has a thin layer of strontium 90 on a semiconducting wafer (germanium or silicon) with a transistor-like junction on the opposite side. Beta rays from the radioisotope release 200,000 times as many slower electrons in the semiconductor. Result is a potential between junction and wafer. Current of 5 micro-amp. with 0.2-volt potential is enough to energize a transistor.—Iron Age, Feb 4, p85

Nickel Substitution—Nickel-free, high-strength steel wire may be substituted for nickel-stainless steel in application requiring good workability, corrosion resistance, low electrical conductivity, and no magnetism. The alloy, developed by Battelle Memorial Institute, contains, in addition to steel, about 14.5-18.5% manganese, 9.0-11.0% chromium, and small amounts of silicon, copper, carbon and nitrogen. —E&MJ Met & Min Markets, Jan 21, p7

Turbosupercharging — Competition has forced manufacturers of large-size, four-stroke diesel engines to adopt turbosupercharging. This should start a trend toward turbocharging relatively small engines. Increase in output, improvement, in fuel consumption, and reductions in weight, size, and manufacturing cost should be almost revolutionary.—Automotive Ind, Mar 1, p45

Growing Old—Scientists meeting in New York in March agreed that people probably grow old because of decreasing gland activity, poorer metabolism, and vitamin B deficiency. Chemical agents may retard the process. One opinion was that age of the mother may govern life span of the children. —Chem Wk, Mar 6, p13 and 32

Ropes From Plastics—Polyethylene film and monofilaments, saran film, and polyester film are being made into ropes. Rope inherits properties of plastic used. Market is small, but still growing—Mod Plastics, Mar, p90

Biggest Truck—Claimed to be the world's biggest truck, a twin-engine ore carrier is being built of welded construction by Dart Motor Co., Kansas City. It is 32½ ft. long, 11½ ft. wide, 11½ ft. high. It rides on 12 wheels, carries 60 tons, weighs 120 tons.—Weld Eng, Mar, p32

BUTYRATE PIPE gets connected to crude-oil tank. Material has long service life under corrosive conditions.

HACKSAW, cement, and thinner (circle) are only tools needed to connect butyrate pipe to oil well.

Plastics Pipe: New Goals

Huge markets are ahead for the plastics-pipe industry. Standards are being set up. There is plenty of business for the bold, efficient manufacturer

WITHIN 10 YEARS, pipe will become one of the five largest outlets for plastics materials. So say industry observers. To find out what is going on in the plastics-pipe industry, *Modern Plastics* magazine surveyed key people throughout the industry. Here are the results of that survey:

Many kinds of plastics are going into pipe. Polyethylene and cellulose acetate butyrate are the most used at present. Rigid vinyl is being developed in the U.S., but Europe has had it for at least 15 years.

Styrene-copolymer pipe has definite possibilities. But there is still not enough of it in actual use to determine its long-range possibilities. Saran pipe has been in use for several years. Cost and processing problems limit it to specialty applications.

Fluorocarbon pipe looks promising in anti-corrosion and high-heat-resistant applications. But its high cost will limit its volume. Even vinyl-treated fabric material has possibilities as a pipe material. And phenolic-glued plywood is being considered for certain limited applications.

Phenolic extruded pipe may also move into the market. It would have the advantage of temperature resistance up to 300°F., or more. But its brittleness would make it an unfavorable material under some conditions.

Pipe made of polyester resin reinforced with fibrous glass has appeared in fair quantities, but it still remains largely on a trial basis. Several resin producers say that today there is no suitable polyester resin for pipe, but they hope to develop one soon. There seems no doubt that a good leakproof, shatterproof, chemically-resistant fibrous-glass pipe could be sold to a big market.

Polyethylene pipe is the biggest-volume plastics-pipe material now on the market. A close approximation for 1953 would be 20-million lb. of virgin polyethylene. All but about 3-million lb. went into private water systems—jet wells, tapped wells, and springs. Such uses are generally in rural communities and largely for agricultural purposes wherever farmers find need for conveying water.

Half the 3-million lb. went into mine pipe. The other 1½-million lb. were used largely for golf-course irrigation, skating rinks, freezing plants, and food- and beverage-plant water lines.

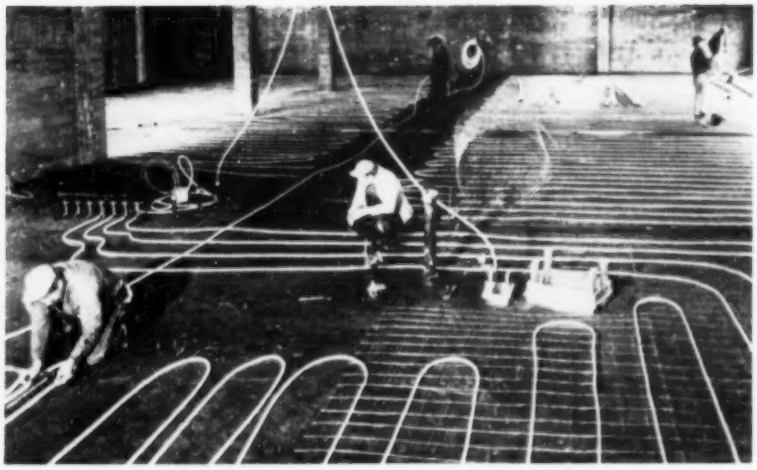
Estimates for 1955 volume can be only rough guesses. Conservative sources estimate a volume anywhere from 35- to 50-million lb. of polyethylene pipe for that year.

Cellulose acetate butyrate pipe production increased from an estimated 1½-million lb. in 1951 to between 3- and 4-million lb. in 1953. The target for 1955 is at least 7-million lb.

Oldest use of butyrate pipe in this country is an installation of over 100,000 ft. in California for transportation of natural gas by a utilities company. Butyrate pipe has found favor because of ease of installation and its anti-corrosive property in acid soils. It is easily joined by solvent welding with slip-on sleeves, and butyrate molded fittings attach readily.

Butyrate pipe is not recom-

WELL-TO-HOUSE pipeline installation is easy with polyethylene pipe.



POLYETHYLENE TUBING halves installation time on this radiant-heat installation. No special tools are needed. Material withstands heat generated.

AIR BLAST CONVEYS paper cups through butyrate pipe without damage.

POLYETHYLENE PIPE provides high corrosion resistance and flexibility in mine-tunnel application. Acid mine water has no affect on pipe.

mended for artificial gas or ground that is unusually rocky. Butyrate pipe is used in various cold-water applications in several manufacturing plants where its transparency and anti-corrosive properties are of particular value. The biggest potential for butyrate (and for all rigid thermoplastics) pipe could be in the oil fields where sour crudes, paraffin, and brine are problems.

Rigid-vinyl pipe is still new in the U.S., except in chemical plants where its chemical resistance and good strength have advantages. A new 3,000-ft. installation has been placed in a chemical plant in the Detroit area.

Rigid-vinyl pipe is a potential competitor for nearly all outlets where other kinds of plastics pipe are used. It is exceptionally good outdoors because of its weathering properties. The wine, dairy, mining and other processing industries have had vinyl tubing or pipe on test for some time, but no decision on performance has been made.

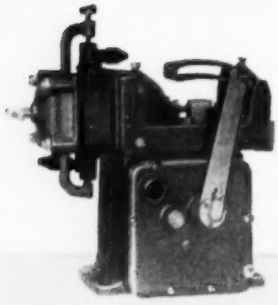
Pipes for irrigation and water supply will form another outlet. A 1-in. rigid-vinyl pipe eventually will be made at a price to compete with anything else in this field, including aluminum.

Various projects are under way to coordinate the activities of plastics-pipe manufacturers and to promote a healthy growth for the industry. For example, the Gas Distribution Engineers have been asked by the Society of the Plastics Industry, Inc. to submit pipe sizes that are most desirable.

The Battelle Memorial Institute has a pipe research project, sponsored by S.P.I., that will provide data on bursting strengths, establish safe working pressures, determine the effect of water hammer and other pertinent facts. Information gathered will then be discussed with the Gas Association, American Waterworks Association, Petroleum Institute, and a group of of plumbers who make recommendations for plumbing codes.

The S.P.I. is also working with the National Sanitation Foundation. Its study will determine whether or not thermoplastics pipe presents a health hazard.—Mod Plastics, Mar, p73

here is...



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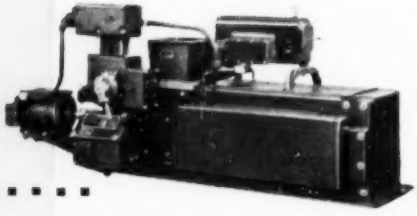
FLUORIDATION PROBLEM .....



In 1945 three controlled fluoridation studies were initiated in the United States and Canada. Two of these installations — Newburgh, N. Y., and Brantford, Ontario — were equipped with Wallace and Tiernan Fluoridators.

Since that time Wallace & Tiernan has continued to develop a complete line of Fluoridators and accessory equipment. Into this development have gone the experience, precision manufacturing technique and research which helped devise Chemical Feeders of all types in the past forty years.

An indication of the present world leadership of W&T Fluoridators is the hundreds of W&T Fluoridation installations now operating or in preparation. Whether the daily water consumption of your community is hundreds or millions of gallons, there is a W&T Fluoridator to meet your fluoridation requirements.

When you consider fluoridation, communicate with Wallace & Tiernan. There's no obligation.

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AGENTS IN MOST COUNTRIES

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Mechanization Comes to Silk-Screen Printing

Silk-screen printing methods are not easy to mechanize. The size of a repeat cannot be run on a roller printing machine. Color combinations expected by the customer cannot always be obtained on rollers. Thus, screen printing, at least in its most artistic form, must remain a hand operation.

But Castle Creek Prints, Inc., has done these things to achieve almost continuous flow:

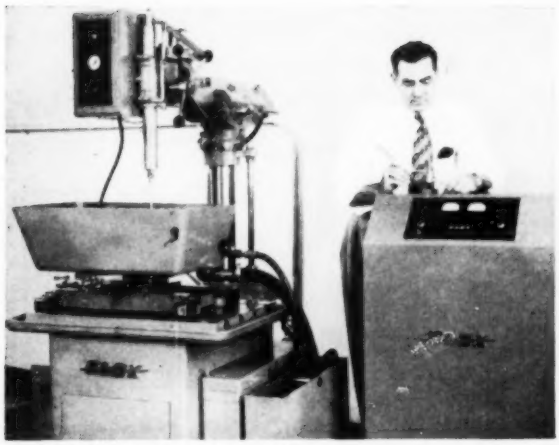
• **Eliminated pinning** with special wax-topped printing tables. Cloth adheres to the wax and remains in perfect register without the laborious task of pinning.

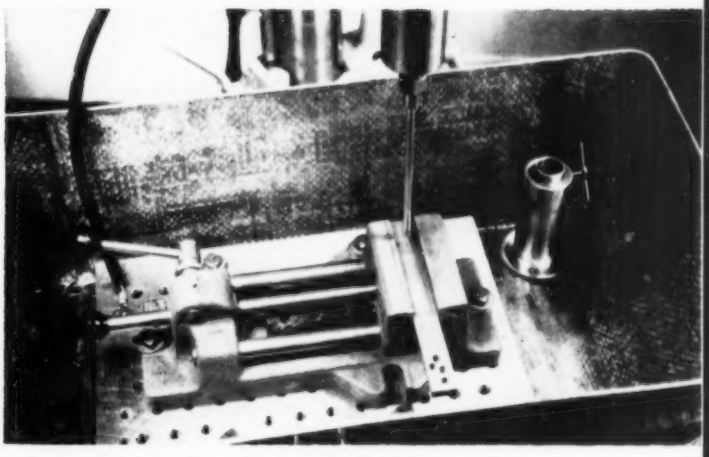
• **Expedited drying** by the installation of an overhead-supported steam-heated dryer. Cloth, after printing, is elevated on rods and festooned on overhead racks. The dryer rolls on a track perpendicular to the ends of the tables. The dryer operator goes from one table to the other and feeds the uppermost festoon into the dryer. A roll-batching device at the dryer exit rolls the cloth on a shell, ready for the steamer-developer.—Textile World, Feb, p113

New Paints Introduced

Two new unusual paints have been developed by Sherwin-Williams Co. Opal-Glo represents a new approach in use of aluminum powder and colored pigments to give an effect of depth. Metal particles are kept on edge to get internal reflection for the effect. The paint is first brushed on, then rolled to orient the metal flakes. It is particularly suited for commercial establishments where decorative effects are desirable.

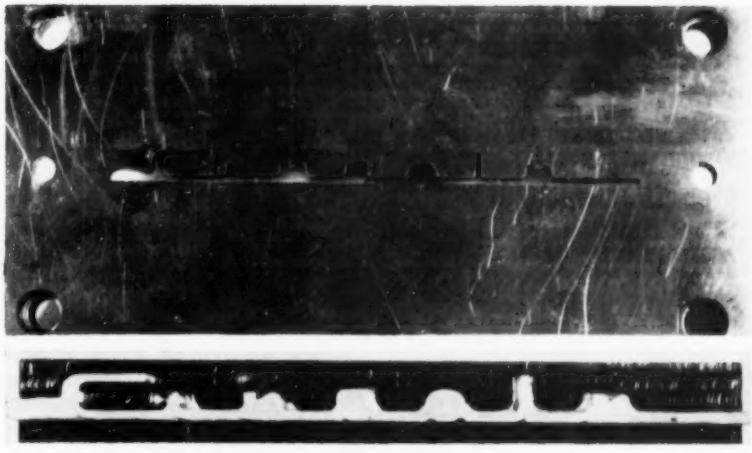
The other new paint, Applikay, is a translucent, opalescent material for use in homes with Super Kem-Tone latex paints. It is applied with a special two-roller applicator on walls already painted with Kem-Tone. A fabric-coated roller picks up paint from the tray and spreads it on a plastic roller. The latter roller has embossed on it a design that it transfers to the painted wall.—Chem Wk, Feb 6, p56



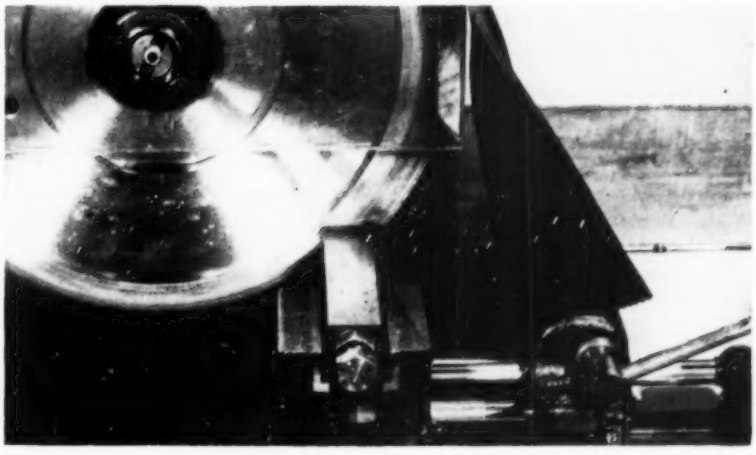


BASIC MACHINE for electrical-discharge machining gives series of discharges between electrode, shaped to desired hole dimensions, and the work. Vaporization and ionization remove the metal. Process can cut holes of many shapes and sizes. The electrode is usually solid brass, except for formed sheet-brass electrodes for trepanning larger holes.

What Arc Machining Can Do



TRIM DIES for die castings are often complicated. This one (top right) trims the word, "Lincoln," which is actually 5¼ in. long. A single electrode (bottom right) was formed from brass on a profiler. The die, 5/16 in. thick, was cut in 55 min.—48 min. for the coarse and 7 min. for the fine cut. Total labor and material cost was $37, or about one-tenth that of a comparable segmented die. Other dies also can be made readily by electrical discharge machining. Extrusion dies are made by cutting die cavity undersize and cleaning up to size with the same electrode for both operations. Dies are cut from the back so the taper from electrical-discharge machining provides the required relief for extrusion.



GRINDING to close tolerances at high speed is possible with electrical discharge. The wheel, made of brass, does not touch the work and, therefore, cannot jam. It generates no heat in the work, so there is no danger of heat checking. The setup shows a single-point carbide-tipped tool held in a simple vise. Two passes, roughing and finishing, sharpen the tool to a surface finish of 15 mu. in. rms. The wheels removed 0.060 in. of stock. Usual practice would be to use rotating angular fixtures for grinding all surfaces. Any conventional grinder can be converted to electrical-discharge machining by substituting a brass wheel for the conventional grinding wheel and adding a motor to give a speed of about 100 rpm.—Am Mach, Mar 15, p137

(Advertisement)

In Insulation . . .

The electrical industry has looked to Irvington for almost 50 years

Since its organization in 1905, Irvington Varnish & Insulator has devoted the major portion of its research and production activities to the development and manufacture of all types of flexible electrical insulating materials required by industry. The company's first product was an oiled cambric cloth, which was the forerunner of varnished cambric.

Varnished cambric still remains one of the most widely used types of electrical insulating materials. Irvington, of course, has consistently expanded its product line to anticipate new insulating needs, but at the same time it has expanded its manufacturing and distribution facilities to bring its products—both old and new—to the electrical industry throughout the world.

In more than 30 countries, experienced representatives are prepared to offer technical assistance in the use of a comprehensive line of Irvington electrical insulating materials. These representatives are ready to supply literature and samples on a wide range of varnished and coated products with bases of cambric, glass cloth, paper, canvas, rayon and nylon, as well as on insulating varnishes.

As one of the oldest producers of flexible electrical insulation, Irvington has selected its representatives in accordance with the same high standards that have controlled its own research and manufacturing. Your Irvington representative brings to you **both** a thorough knowledge of electrical insulation—supported by Irvington's own technical staff—and a thorough acquaintance with the requirements of the electrical industry in your geographical area. We hope you will get in touch with him. Irvington Varnish & Insulator, Division of Minnesota Mining & Manufacturing Company, Irvington 11, New Jersey, U.S.A.

Italian Commuter or Long-Haul Train

New Italian diesel-driven train has a trailer car sandwiched between two power cars. Each power car has a horizontal, 12-cyl., 505-hp. diesel engine. The trailer car seats 64 passengers and has two washrooms, a bar, and a kitchen. Fiat, better known as an automobile manufacturer, is building 20 trains for Spain and 3 for Portugal.—Prod Eng, Mar, p211

Stripcoating for Cheese

United Cheese Co. wanted a special wax coating for consumer portions of cheese. To be effective the coating would have to be slit, removed, and replaced for continued product protection.

Tests led to the development of a composite coating made up of alternate layers of cheese wax and a specially formulated non-toxic vinyl lacquer. Special equipment to handle the actual application of the protective coatings was also developed.

The coating cuts shrinkage and increases shelf life of the product by minimizing mold growth. Consumers like it because it provides a convenient package until the cheese is consumed.—Mod Packaging, Jan, p95

Reinforced Plastics In Continuous Lengths

A tough, translucent and durable building material has now entered the by-the-yard market. It is a colorful fibrous glass-reinforced structural sheeting made by a continuous process.

In the process a roll of glass mat is impregnated with light-stabilized polyester resin and color paste, and rapidly cured. The machine can produce a sheet—corrugated or flat, rippled or smooth, opaque or translucent—as long as 150 ft. Width may be from 1 to 5 ft.

The corrugated sheets are intended for exterior use—porch roofing, skylighting, awnings. The flat sheets are popular for shower enclosures and green-house glazing.

Called Spun-Lite and made by Spun-Lite Corp., the material has impact strength exceeding most code requirements, yet is flexible enough to be made into rolls. Handling and shipping are simplified. Installation is also simple because of the fewer joints necessary.—Mod Plastics, Feb, p89

Better Milk Powder

Whole milk powder that is superior in flavor, palatability, and keeping quality is now obtained by combining concentrated skim milk and a water-fat emulsion and then spray-drying it.

Skim milk, with pH 6.8–7 and milk fat content of 0.15%, is flash-pasteurized. It is then concentrated by vacuum evaportion to 35–55% solids. The concentrate is mixed with a special water-fat emulsion, prepared by combining a suitable fat, such as hydrogenated cottonseed oil, with a solution of sodium caseinate. The patent on the process has been assigned to Western Condensing Co.—Food Eng, Mar, p181

- New products
- Better methods
- More research
- High demand,

these are the signs of the...

TOUGH Pyrex-brand glass pipe, here shown in a Corning Glass Works' mobile exhibit, has solved costly corrosion problems for many industries

Glass Industry's Bright Future

NEW PRODUCTS and improvements in existing products give the U. S. glass industry a promising future. Research and development are keeping the industry up to date on both products and processes.

In the field of glass fiber, for example, the constant development of new products indicates that it may soon be a major producer in the glass industry. Among such developments are:

• A new technique now makes it possible for any boat owner to cover his boat's hull or deck with laminated glass-fiber cloth. Kits consisting of a ready-mixed resin and glass-fiber cloth cut to size are now on the market. The laminated surface is affected neither by salt- or fresh-water growths nor by sunlight or sea water.

• Another promising use for reinforced glass-fiber plastics is a new type of corrosion-resistant crude-oil storage tank. Advantages are long life, reduced vapor losses, lower shipping costs, and easier erection. The reinforced-plastic material is impervious to damage by the hydrogen sulfide gases, salt water, electrolytic action, and other deteriorating influences from crude-oil storage.

• A new industrial fabric with many potential uses is made of two sheets of vinyl film and a center layer of glass-fiber fabric. It is strong, lightweight, nonabsorbent, and resistant to mildew, fungi, acid, grease, and flame. It will neither shrink nor stretch. It resists cracking to temperatures as low as —30°F.

• Glas-Line is a new clothesline that will not stretch. Extruding a plastic cover over a core of glass fiber is the no-stretch secret.

• New for builders is a 17-lb. bathtub. Made of reinforced glass-fiber plastic, it will neither chip nor dent in ordinary handling during installation. It looks like a conventional tub.

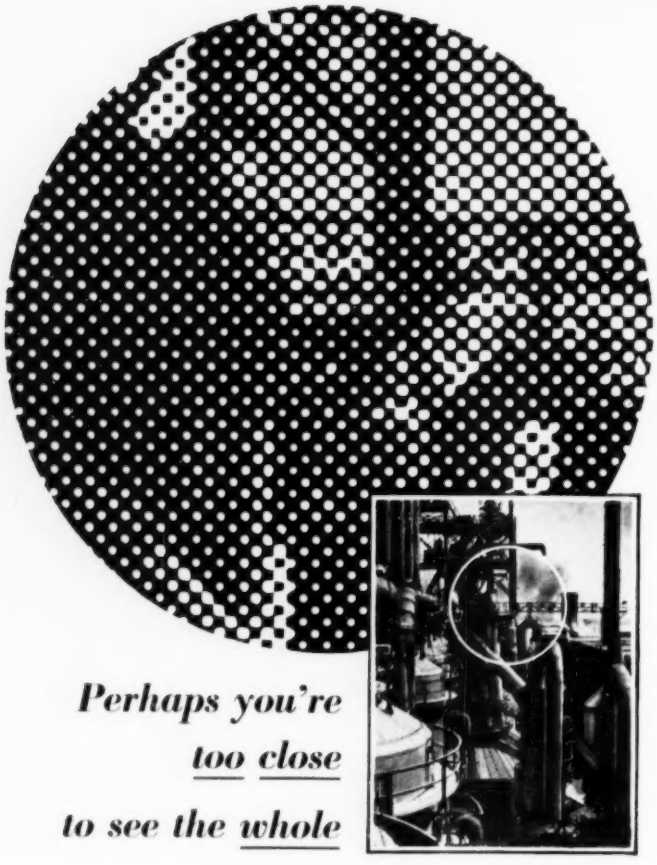
Other notable new glass products include lead-glass barriers for deadly gamma rays and borosilicate-glass pipe and dinnerware. The gamma-ray barrier is a cerium-stabilized, lead-glass transparent window 4 in. thick. It measures 3x4 ft. and weighs about 1,000 lb. These barrier windows are the heaviest in the world and will be framed in steel for assembly in atomic piles.

Borosilicate-glass pipe is serving many industries. They are discovering that glass pipe will solve many corrosion problems and, at the same time, show flow rate, color variance, and turbulence. Its smooth surface lets fats, pulps, and other substances be washed away easily.

A novel adaptation of glass containers is in shooting of oil wells. Borosilicate-glass containers protect shaped charges from liquid pressures in deep wells. When the charge explodes, the glass disintegrates completely, leaving no residue to interfere with pumps or gages.

Attractive dinnerware is now available in borosilicate glass. It is strong, lightweight, heat resistant, smooth and therefore easy to wash. With no surface glaze to chip, crack, or craze, the dinnerware will withstand years of rough treatment. It comes in red, blue, green, and gray, with or without a gold-band decoration.

Fused silica is a new material composed of all silicon dioxide glass. Its manufacturing process differs radically from the usual glass-making methods. Uses include ultrasonic delay lines for radar and computers, crucibles for melting germanium, and other semiconductors.—Ceramic Ind, Mar, p72



Perhaps you're too close to see the whole picture

The more details an executive has to supervise, the closer he must be to his business. But there comes a point where attention to details blurs the picture, and makes it impossible to retain a broad view.

Faced with this dilemma, more and more modern businessmen turn to Remington Rand for counsel. Remington Rand – with a perspective which is deepened by 77 years of experience in the business of serving business, and widened by contact with over 2,000 different types of business – can help you get the facts of your business in focus and keep them there!

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Vitamin-Enriched Rice Helps Improve Health

Philippine food plant in 1948 began enrichment of rice by adding a mixture of thiamine, niacin, and iron (McG-H Digest, Jan '49, p34). Here are the results:

Within 1 year, the 63,000 people in that particular area on the east coast of Bataan showed a sharp improvement in health. Beriberi had previously affected 13%; after 1 year, only 1½% showed symptoms and they were mild and residual. Deaths from beriberi fell correspondingly, while on the west coast of Bataan beriberi symptoms and deaths remained unchanged.

The Philippine government has passed a law prohibiting the sale of unfortified white rice. It will become effective as equipment becomes available in the different mills to add the vitamin premix.

Other mills using the process, developed by Hoffman-La Roche, Inc., are in Singapore, Bangkok, and Japan. A similar need exists in many other Asiatic areas and in Latin America, too.

Puerto Rico has made great progress in use of fortified rice. The situation is less favorable in Cuba as millers there are producing no enriched rice. But in Cuba and some other areas, its adoption is inevitable within a few years.—Food Eng, Feb, p96

New Device Sorts Metals

The thermoelectric metal comparator quickly sorts mixed metals. It was developed by General Motors Corp.

The comparator works on the principle that the junction of two dissimilar metals will generate a voltage that varies with junction temperature and material. Sorting is done by comparison of the voltage generated with those of known samples. If samples are not available, the stock can be sorted into groups; one sample from each group can then be analyzed to identify the whole group.

Other uses of the device include measurement of plating deposit thickness, of foil thickness, of nonconductive film thickness, and mill control of metal chemistry.—Iron Age, Mar 4, p162

Vacuum Packing Cuts Lettuce Handling Costs

Vacuum cooling has been adapted to the preservation of a large portion of the California-Arizona lettuce crop. Lettuce used to be packed in crates and shipped in layers of ice; the vacuum process is now changing the whole procedure.

Heads of lettuce are field-packed by unskilled labor in lightweight fiber-board cartons, which are stacked on pallets and moved into vacuum chambers. Within 15 to 20 min., the high vacuum has extracted most of the water from the outer leaves of the lettuce; the heart stays moist.

As the water vaporizes, the temperature drops, changing from field temperature to 33° F. in about 15 min. without any use of ice. Then the lettuce is shipped in refrigerated cars to the East Coast.

The principle benefit from vacuum cooling is its lower cost. As an example; the old 48-head wooden crates cost between 70 and 78¢, while two 24-head cartons now cost from 56 to 60¢. To this must be added the wage differential of unskilled field hands and skilled ice packers. An additional cost reducing factor is the greater mechanization of handling possible with vacuum cooling. Total saving is about 50¢ on two cartons.—Business Wk, Jan 23, p102

New Fracturing Idea

A new gun perforator increases oil recovery by creating fissures and cracks (fracturing) in the oil-productive formation. It was developed by Welex Jet Services, Inc., Fort Worth, Texas.

The tool is a gun that shoots around a corner. It fires a missile straight down the well, turns it at 90°, and directs it into the formation. A curved channel at the end of the tool turns the missile.

The missile strikes with an energy of several hundred thousand foot-pounds—about 100 times the energy of conventional perforating means. In one well, four rounds were fired, followed by successful acidizing. Flow increased from 33 to 160 bbl. per day.—Oil & Gas J, Feb 22, p108

How much money do you lose in your accounting department?

This question may surprise you, but just think back to how your accounting department grew. A book or ledger at a time. Now and then a new form . . . or file . . . or business machine. Stopgap measures like this may solve the problem at hand, but — in the long run — they take a heavy toll in efficiency and economy. It's like having a hole in your pocket — only costlier, harder to find, and harder to mend.

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THE FINISHED-PRODUCTS laboratory maintains tests to determine quality

Improving Food Quality

Quality control in food processing is essential. It should serve as a bridge between the consumer's tastes and plant production methods

PROCESSING TANKLOADS of raw vegetable oil into technically delicate shortening, margarine, and salad oil requires strong emphasis on control.

The Jacksonville, Ill., plant of Mrs. Tuckers products (Division of Anderson, Clayton and Co.) has solved the problem through its control laboratory system. Key to the rarely-troubled routine of this plant is its process control laboratories.

Each laboratory functions as a "watchdog" over the three phases of plant manufacture:

1. Refining and bleaching
2. Process control
3. Finished products

Main function of the refining and bleaching laboratory is to check the crude cotton or soybean oil entering the plant for quality and grade. The seed oil produce is paid on the basis of laboratory's analysis. The laboratory also offers routine checks on refining efficiency and refined oil quality.

Largest and busiest is the process-control laboratory—heart of the control program. Among the many vital items on which it makes routine checks are: hydrogenation end-points, deodorized oil flavors and odors, post-bleaching colors, and cold test of winterized salad oil.

In addition, it keeps track of tests on boiler water, water softening, and cooling-tower water. Any deviations in data during these routine checks are immediately checked to avoid costly in-plant mistakes. Armed with this data the quality supervisor, familar with process technology, can quickly trace any difficulties.

The finished-products laboratory maintains tests to determine quality in the final product. Here, for example, shortening is tested for plasticity, air content, color, free fatty acids, peroxide numbers. As part of his duties, the laboratory supervisor conducts weekly warehouse inspections to eliminate over-age stock from storage.

Supervising the entire quality-control operation is the quality supervisor. A chemist or chemical engineer by profession, he is technically supervisor of the central laboratories. In fact, he spends 80 to 90% of his time in the plant as uring that laboratory standards are maintained. His real task i: to find out what is wrong whenever a deviation from the quality limits is discovered.

To be efficient in his job, he must keep abreast of the latest technical thinking in the industry. Even more important is the need to be completely aware of the latest desires of Mrs. Tucker's customers. For in the last analysis the quality supervisor must bridge the gap between the buyers' personal wants and the large-scale impersonal methods of the production floor.—Food Eng, Mar, p64

Papermaking Shorts

▶ **Papers** containing glass fibers show superior thermal stability, long shelf life, dimensional stability, chemical inertness, filtration efficiency. Uses: electrical appliances, plastic impregnation, filtration. Preparation of stock from blown glass fibers is best carried on by a light beating at a consistency of not over 0.5%.

▶ **The Far East** can go a long way in expanding its pulp and paper industry. Comparisons on per capita use of paper: U. S.—395 lb.; Japan—35 lb.; Indo-China—0.7 lb.; Thailand—2.8 lb. Formosa has the world's largest bagasse pulp mill.

▶ **New sizing agent,** made by American Cyanamid Co., is a salt of a hydrophobic polyfunctional amine. It improves paper resistance to ink penetration, color degradation, and butyl carbitol penetration. It also reduces tendency to curl.—Paper Ind, Mar, p1304

By-Product Uranium

Uranium concentrate is recovered as a by-product in the new phosphate-products plant of Texas City Chemicals, Inc. Unit was designed to recover uranium concentrates as a by-product of feed-grade dicalcium phosphate and fertilizer-grade dicalcium phosphate derived from Florida phosphate rock containing minor quantities of uranium.

Another commercial unit is operated by the Blockson Chemical Co. in Illinois. Uranium is recovered as a by-product of sodium phosphate chemicals.—Eng & Min J, Mar, p188

Typical Case Studies in Electric Heating

Advantages of electrical heating are being recognized by an increasing number of plant engineers. Here are examples of how they have utilized electrical heating in industrial processes:

• **Motor baking time** has been cut in half by Torg Industrial Power and Mfg. Co., Cleveland, by using a flexible two-section baking unit with each section containing twelve 250-watt infrared lamps. The mobile assembly unit serves for both preheating and after-dip baking.

• **Tanned leather drying** is speeded up at Hoffman-Stafford, Chicago, with infrared lamps. A metal-mesh, chain-driven conveyor carries the skins in 2½ min. under three banks of 80 G-30 clear-glass 375-watt lamps located 18 in. above the skin surface.

• **Radiant heating unit** at Lien Rubber Mfg. Co., Los Angeles, improved plant efficiency by more than a third. The latex foam sponge rubber is now poured into aluminum molds and conveyed through a 42-ft. zoned radiant infrared tunnel. The tunnel utilizes 30 1.8-kv. Chromolox heating units.—Elec C&M, Feb, p78

Device Prestresses Beams

Precast concrete beams 50 ft. long for a building floor in Ft Lauderdale, Fla., were prestressed by winding high-strength steel wires around them at full tension. The method eliminates costly bearing plates and end anchorages.

A machine rolled back and forth along a precast beam, while the wire was fed from a 400-lb. coil mounted on a rotating turntable on the machine. The method is similar to that used for prestressing concrete tanks. The 1.75 miles of wire were anchored with an end fitting held by a flat bar wound under the wires. A coat of lightweight mortar was then placed pneumatically over the wires to protect them against corrosion.

Richardson Construction Co. was the general contractor. Crom Corp., Gainesville, Fla., holds a patent on the wire-winding machine.—Eng News-Rec, Feb 25, p41

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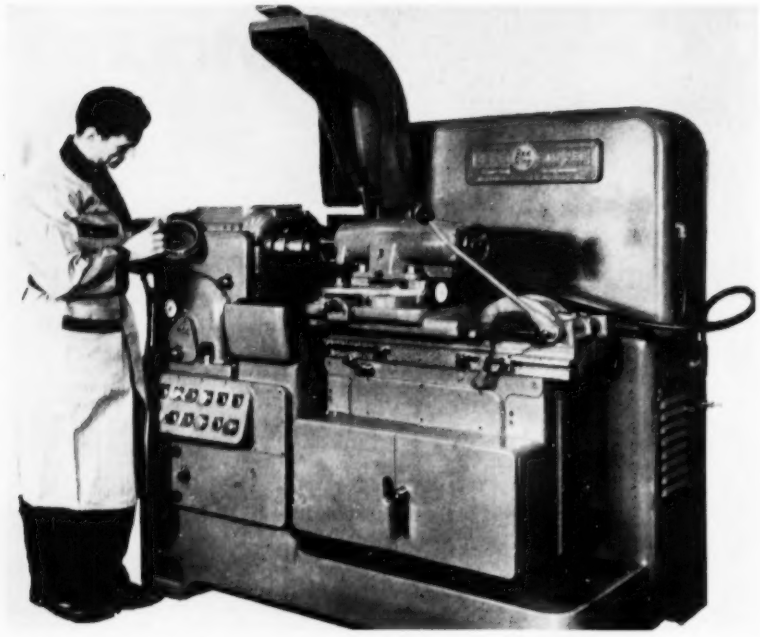
NEW PRODUCTS



Red Ring Machine Precision-Shaves Internal Spur and Helical Gears

Red Ring gear-shaving machine, model GCR, finishes internal gears from 3- to 12-in. pitch diameter. It shaves gears with up to 4 diametral pitch teeth and 2½-in. face widths.

The machine works on the crossed-axes principle. Work is mounted on the driving head with the axis in a horizontal plane. The cutter engages the gear with its spindle centerline set at a crossed-axis angle with the work.

Either conventional or plunge-cut grinding is done. In conventional grinding, the work drives the cutter and the cutter is reciprocated across the work face. The cutter is fed at the end of each stroke. In plunge-cut grinding, the cutter is fed in without reciprocation.

Cutter reciprocation motors and coolant pump are located in the cast-iron base. The work-drive motor is mounted on the base behind the workhead. Either pot-type or diaphragm work-holding chucks can be installed on the workhead. To allow taper shaving operations, the workhead can be locked in positions up to 1½° on each side of a vertical centerline.

The cutter spindle is mounted on a knee, which is supported vertically by a leadscrew and nut assembly. The entire spindle and slide assembly are reciprocated back and forth during shaving. Other machine features include a differential upfeed mechanism, centralized pushbutton controls, and change gears for work-spindle and cutter-reciprocation drives.

The upfeed mechanism is an air-operated stepped gaging device. It provides (1) automatic precision upfeed in selected increments throughout the shaving cycle and (2) automatic return to the correct backlash position for loading and unloading.—**National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.**

It's Now Original

With this issue, the New Products department ceases being a "digest." The department will now announce only the new equipment and materials that are available and particularly suitable for export and use overseas. We shall continue to give you the manufacturers' names and addresses so that you can write directly to them for further information. When doing so, we suggest that you tell the manufacturers as much as possible about your particular needs and the conditions under which the equipment will be operating. They can then make best recommendations. Also, when you write, please mention the McGraw-Hill Digest to help the manufacturers identify the products you mention. We'll forward your letters if you want us to do so, but original articles will not be available.

Office Copying Machine

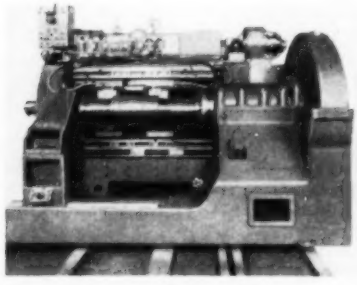
Called "Bambino," a new office copying machine is only slightly larger than a standard typewriter. Machine was designed for the average office for routine copying of letters, accounting statements and reports, purchase orders, bills of materials. In fact, anything that is written, typed, printed, or drawn on translucent paper up to 9 in. wide and in any length can be reproduced on the machine.

Operating costs are as low as 1½¢ for each letter-sized copy, including labor and materials.—**Ozalid Div., General Aniline & Film Corp., Johnson City, N. Y.**

Low-Cost Office Computer

Designed to overcome previous objections to electronic computers, a new low-cost office computer, called the ALWAC, will work speedily from a long sequence of orders stored in the machine itself. Lengthy processes can be carried out without any action on the part of the operator, and as many as ten operators using electric typewriters at various locations can share ALWAC simultaneously.

The computer can be useful to insurance companies for billing insurance premiums and other data, as well as department stores and offices for replacing clerical employees doing numerical work. —**Logistics Research, Inc., Redondo Beach, Calif.**



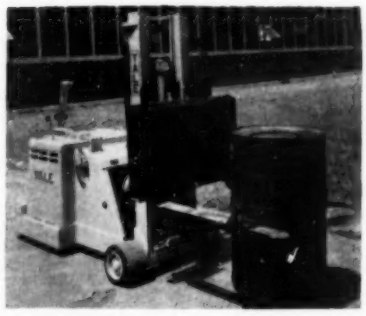
Twin-Head Gear Generator

Redesigned Farrel-Sykes gear generator gives fine precision at high operating speeds. Accuracy is high, tooth finish is good. The twin-head machine can cut continuous-tooth herringbone, double helical, single helical and straight-tooth gears.

Machine features include rapid speed and feed selection, easy cutter adjustment, and positive control of infeed and depth of cut. —**Farrel-Birmingham Co., Inc., Chrysler Building, New York 17, N. Y.**

Fast Strip-Feed Press

Automatic strip-feed press makes can ends and closures at speeds above 300 surface ft. per min. Features include a combination disk friction clutch and brake, crank-driven feed bar, no idle stroke between strips, and 16x17-in. bolster area. The press timing is arranged for the slide to stop automatically at the top of the stroke.—**E. W. Bliss Co., Canton, Ohio.**



Pallet, Drum, Box Handler

Attachment increases fork-truck versatility. It makes possible the handling of many different pallet sizes. Special-purpose jaws and a clamp attachment can be slipped on the forks for handling cartons, boxes, and drums. Fork spread can be varied hydraulically between 18-in. and 62-in. centers.—**Yale & Towne Mfg. Co., Roosevelt Blvd., Philadelphia 15, Pa.**

Crawler Tractor Improved

Redesigned D2 tractor is longer, heavier, and more powerful than the older model. Drawbar horsepower has been raised to 35, and tractor surface to 1,460 sq. in. The increased length allows removal of the flywheel clutch without disturbing the engine. Other improvements include: better access to steering-case clutch, track carrier roller as standard equipment, greater fuel-tank capacity, and the ability to use cheap No. 2 furnace oil.—**Caterpillar-Tractor Co., Peoria, Ill.**

Extracts Oil and Water

New AO-120 extractor traps all oil, water, rust particles, and other foreign materials common to compressed air lines. Impurities are prevented from reaching spray guns. Device also stops clogging.

The major improvements claimed are more efficient air cleaning, easier operation, longer life, and lower maintenance costs.—**Binks Mfg. Co., 3128-30 Carroll Ave., W., Chicago 12, Ill.**

Packaged Screed Lets Contractors Build Their Own

Packaged unit allows contractors to build their own vibrating screed according to their own specifications. Package includes a Power-Pak consisting of a 2-hp. gasoline engine and a built-in vibrator. Package also includes a pair of end rollers complete with shoes, handles, and deflectors. Contractors can use their own beams or obtain them in lengths from 7 to 31 ft.—Stow Mfg. Co., Binghamton, N. Y.

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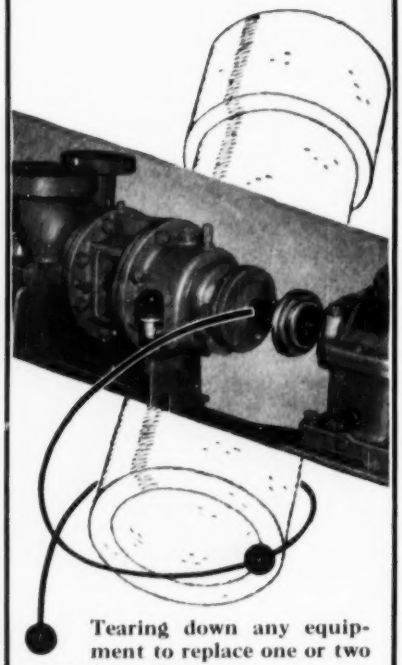
stops wear-worry



Tearing down any equipment to replace one or two parts is costly.

That is why pump manufacturers world renowned for quality, commonly use stainless steel to resist corrosion or high temperature but choose *Deloro Stellite* to protect shafts, sleeves and other critical parts against added wear from abrasion. It keeps pumps running from 300% to 1000% longer between overhauls.

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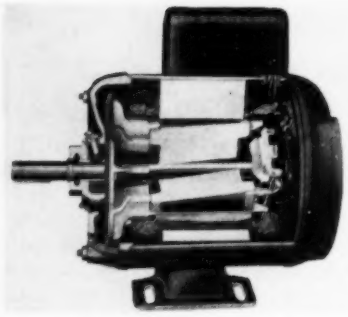
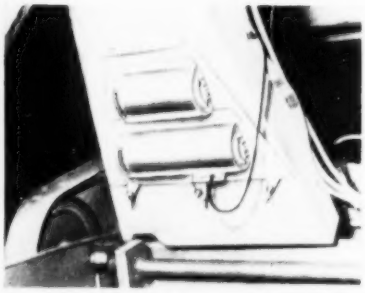


Fractional Hp. Motors

Open type, drip-proof fractional horsepower motors are available in these models: (1) type SP—split-phase, single-phase induction motors for uses where the load is easy to start and pull up to speed; (2) type CS—capacitor-start, single-phase motors where the load is hard to start, as on pumps and compressors; (3) type SC—squirrel-cage, two- or three-phase motors for general use. Ratings are $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1 hp.

Die-cast aluminum squirrel-cage rotor carries an integral cluster-type fan. Sleeve bearings are phosphor bronze. The governor has equalized actuating pressure in operating the switch because of the yoke design that contacts the governor plate.—**Century Electric Co., St. Louis 3, Mo.**



Guards Permanent Magnets

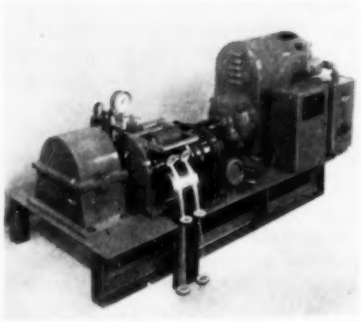
Alarm system eliminates human error in maintaining permanent-magnet separators. Magnalarm has a sensitive ferrometer that constantly measures the quantity of tramp-iron accumulating. At a set quantity, alarm is actuated.

The alarm may be located at the magnet or remotely. It offers a positive automatic indication that the separators need cleaning.—**Eriez International Corp., 26 Grove Drive, Erie 2, Pa.**

Stacks Loads Lengthwise

Fork-truck accessory stores long loads of lumber, bar stock, and pipe lengthwise without manual handling. Costly piece-by-piece handling is eliminated.

Unit consists of two hollow forks with a roller attached to the outside edges. These fit sheath-like over the truck's forks. They are connected to the main hydraulic system with quickly detachable couplers operated by a valve in the cab.—**Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.**



Glass-Roving Cutter

New roving cutter cuts fibrous glass used in making reinforced-plastics preforms. In operation, roving is fed through a cemented-carbide backing plate by means of an air stream. A cemented-carbide cutting head shears the roving to the desired length.

Air stream also opens glass roving and cools cutter head. Length of cut is controlled by an adjustable feeding mechanism.—**Turner Machine Co., Inc., 28 Maple Ave., Danbury, Conn.**

Conveyor Switch

A spur curve for roller, wheel and belt conveyors embodies a switching mechanism that makes two-directional control of packages or merchandise easy. It may be manually or remote-control operated; the actuating mechanism may be solenoid, air ram, or manual.

The spur curve is available in various widths and weights of rollers from 1¼ in. to 2⅜ in. dia., and from 7 to 18 gage. They are made in right and left 45° and 90° spur curves and in Y switches with 45° and 90° changes.—**Mechanical Handling Systems, Inc., 4601 Nancy Ave., Detroit, Mich.**

NEW PRODUCT BRIEFS

Wagon Drill—Drill mounted on wagon equipped with dual-hydraulic lift saves time and effort in spotting holes. Two lifts quickly raise or lower the U-bar while the drilling mast is being maneuvered into position. Wagon carries chain feed and heavy-duty 4-in. drill.—**Gardner-Denver Co., Quincy, Ill.**

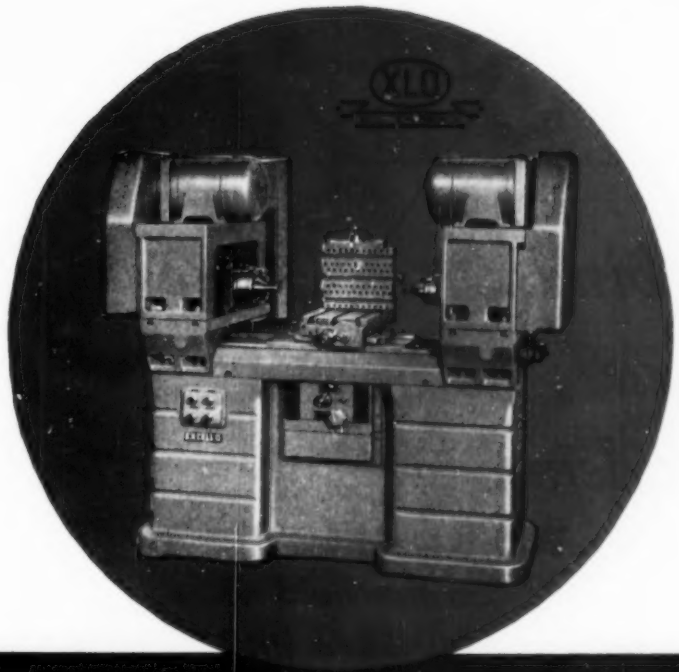
Mig Welder—Metal inert-gas welder consists of closely coupled three-phase transformer, saturable-core reactor in the primary circuit, control windings, and selenium-rectifier stack. It maintains stable welding conditions regardless of variations in the arc condition.—**Miller Electric Mfg. Co., Appleton, Wis.**

Conditions Water—Packaged water conditioning plant forms a self-contained unit for complete conditioning. Eight standard sizes range from 500 to 3,000 gal. per hr. Larger sizes can be furnished.—**Permutit Co., 330 W. 42nd. St., New York 36, N. Y.**

Polystyrene Foam—New bead-like form of polystyrene expands to a tough, snow-white foam. It can also be molded in pre-expanded form. Foam has high insulation properties, good buoyancy, fine cellular structure.—**Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa.**

Large-package Tear Tapes—Cross-tape unit locates cellophane tape accurately at the end of the package or in any desired location. Tape goes around the entire girth of the package and can be made to project any distance beyond the lap of the cellophane, making it easy to grasp and tear off. Unit is suitable for firm's FA adjustable wrapping machines. —**Package Machinery Co., East Longmeadow P. O., Springfield, Mass.**

Stop Skidding — NeoFloor stops skidding on concrete, wood or metal floors. It is a gritty substance anchored in neoprene, which is bonded by adhesive to the floor. NeoFloor is waterproof and resists attack by acids, alkalies, and oils.—**Pennsalt International Corp., 1000 Widener Bldg., Philadelphia 7, Pa.**



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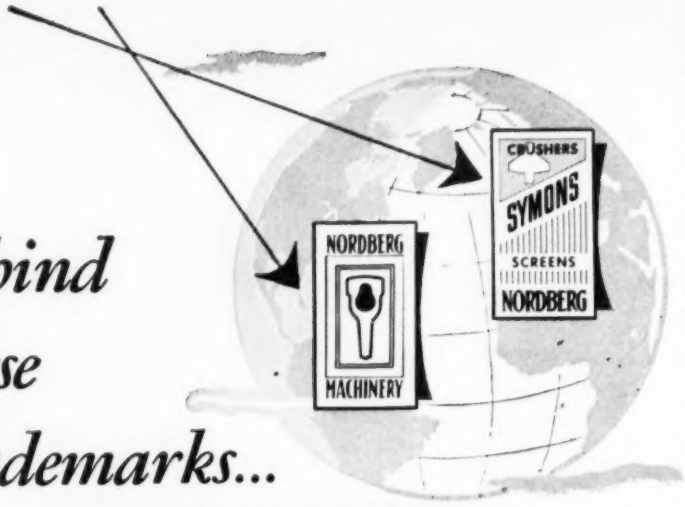

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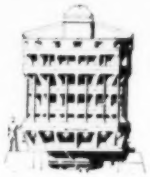

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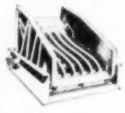

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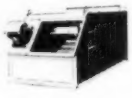

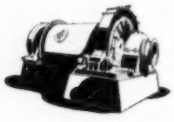

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MANAGEMENT REPORT

Employees have few worries about medical bills at the George Fischer works in Switzerland. The company, in cooperation with another firm, owns a convalescent and rest home. Sickness is taken care of by a social service fund. Even legal advice and financial aid for buying homes and furnishings and paying off debts are provided. Other benefits include vacations and skiing expeditions for employees' children, financial aid for college courses, retirement pensions, and all kinds of recreational facilities.—Am Mach, Feb 15, p177

Construction activity boomed throughout Latin America last year. This year's plans are even greater. These and many other facts are revealed in the Ingenieria Internacional Construccion (McGraw-Hill International Corp.) report, "Major Latin American Construction Projects." Construction projects, by countries, are listed along with information about their location, type, size, cost, and finishing dates.

It's the only study of its kind in the world. If you can use a copy, write us.

What makes a committee work? For the answer, Harvard University's Laboratory of Social Relations is making a study. So far here is what it has discovered:

- A committee should have between four and seven members—ideally five.
- Committees really have two leaders. First, it has the "task leader." He keeps the committee moving logically toward its goal. Most task leaders hurt the unity of the group. Unity is restored by a second man, the "social leader." He is usually the best-liked member of the committee.
- A successful meeting should have about half as many negative reactions as it has positive reactions.
- When disagreements pass some critical point, logic no longer holds.
- The committee must ask: (1) what are the facts, (2) how do we feel about them, (3) what shall we do about the problem.—Business Wk, Mar 20, p42

The increased drive by Europe for automotive exports and the enlargement of the world's stock of vehicles are disclosed in the 1954 World Motor Census, published by the American Automobile (Overseas Edition) and El Automovil Americano. Both are McGraw-Hill International Corp. publications. World production in 1953 topped 10.4-million cars, trucks, and buses.

Exports to non-manufacturing countries approached 1.1-million units. The balance was retained at home. World operation of vehicles reached 81.6-million units by Jan 1, 1954. Not counting the U. S., Canada, and Iron Curtain countries, world operation was 20.4-million.

A summary of the census is available. Write us if you want a copy.

Industrial health programs was the subject of a recent report by the American Institute of Management. It pointed out that a good industrial health program pays for itself in terms of reduced labor turnover, less absenteeism, reduced compensation premiums, and fewer cases of occupational disease.

But the report goes on to say, "An industrial health program must be well-rounded and soundly administered." The best programs were those centralized and coordinated by a medical director responsible to top management.—Am Business, Feb, p43

Many steps lead to successful management. These steps lead to failure.

- Never ask staff departments for help.
- Do not go to meetings on time.
- Do not ask questions.
- Take a well-earned sleep in meetings.
- Have nothing to do with training.
- Pay no attention to workers in other departments.
- Remember your boss is your enemy.
- Do not waste time on quality or people.
- Beware of constructive ideas.

These are the negative sides of management. With them, you can achieve a most complete failure.—Factory, Mar, p100

Trademark regulations have recently meant trouble for exporters to the U. S. The foreign exporter will eliminate costly delays if he checks these items:

- Copies of your trademark should be deposited with the U. S. Collector of Customs if your trademark is registered in the U. S.
- Manufacturers exporting to the U. S. should arrange to have a lawyer make an inexpensive search to tell whether their trademarks conflict with American registrations.

In registering his trademark in the U. S., the foreign exporter protects himself. Notice is served to other businessmen to adopt different names for their products.

PRODUCTION IDEAS

from Manufacturers' Catalogs

Steam Traps—The new Super-Silvertop Heat-Kwik steam traps, which vent air from steam units eight times faster than ordinary inverted bucket traps, are discussed in bulletin 1153.—V. D. Anderson Co., 1935 W. 96th St., Cleveland, Ohio.

Transmission Belts—Catalog 3-8095-G1, covering rubber transmission belting, describes and illustrates construction features of various industrial belts. Catalog also contains sections devoted to oilproof, textile, lumbermill and agricultural belts.—B. F. Goodrich Co., Akron, Ohio.

Hydraulic Cylinders—Cylinders ranging from 2,000 to 3,000 lb. per sq. in. are described and illustrated in catalogs 721 and 741.—The Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio.

Trenching Equipment—Complete line of trenching equipment is illustrated in bulletin S-111-A. Text describes specific advantages, typical job applications, and special construction features of each model.—The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio.

Lightweight Pipe—Bulletin 507 covers typical applications of lightweight lockseam-spiralweld pipe and fittings. Standard specifications, together with data on fabricated fittings, flanges, and connections, are also included.—Naylor Pipe Co., 1230 East 92nd Street, Chicago 19, Ill.

Electric Hoists—Bulletin Q1 describes performance and safety features of all 17 Quik-Lift models from 500- to 4,000-lb. capacities. Cut-away drawings show details of construction.—Coffing Hoist Co., Danville, Ill.

Instrument Transformers—Booklet GEA-4626G covers complete line of transformers. Publication is designed to save time in selecting and ordering current and potential transformers, and metering outfits.—International General Elecric Co., 570 Lexington Ave., New York 22, N. Y.

Combination Refining—Combination processing, the integration of a number of different refining steps into a single, continuous, centrally-controlled operation without intermediate storage, is described in Kellogram No. 1 (1954).—M. W. Kellogg Co., 225 Broadway, New York 7, N. Y.

Excavators—Bulletin 1558923 covers entire Lorain line, from the new ¾-yd. model MC-104 to the 2-yd. model 820. Catalog also illustrates new, extra-long booms and sticks adapted for extra-deep digging.—The Thew Shovel Co., Lorain, Ohio.

Speed Reducers—Complete line of speed reducers is described in booklet b-5646. Features of the equipment are included.—Westinghouse Electric International Co., 40 Wall St., New York 5, N. Y.

Cylindrical Grinders—Catalog AR-653 illustrates plain grinders with spaced wheels, multiple-wheel grinding setups, angular wheelhead grinding, and special tooling and single-purpose cylindrical grinders.—Landis Tool Co., Waynesboro, Pa.

Synchronous Motors—Standard construction features of engine-type, low-speed synchronous motors in ratings of 100 hp. and larger at speeds of 450 rpm. or less are covered in bulletin 05B8008. Stator, rotor and collector assembly features are described and illustrated.—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Conveyors for Steel Industry—Booklet 2426 describes several types of coil conveyors. They are adaptable to large and small coils and are integrated with various types of auxiliary equipment that load and unload the coils, turn, tilt, transfer and weigh them.—Link-Belt Co., 233 Broadway, New York 7, N. Y.

Injection-molding Machines—Various features and capabilities of plastics injection-molding machines in a wide capacity range are catalogued.—Export Dept., Watson-Stillman Co., 150 Aldene Rd., Roselle, N. J.

Adjustable Metal Framing—What Unistrut steel channels and fittings can do with minimum time and effort is described in catalog.—Export Div., Pressed Steel Car Co., Inc., 25 Broad St., New York 4, N. Y.

Power Thread Gaging—Catalog No. 612 describes the bench model and flexible-shaft model Rotochek power thread-gaging units. Catalog lists various collets and adaptors that are available.—The Taft-Pierce Mfg. Co., Woonsocket, R. I.

Plastics Molding Presses—Complete line of presses for fully automatic and semi-automatic molding, preforming, and extrusion are covered in catalog 525.—F. J. Stokes Machine Co., Philadelphia 20, Pa.

Barometric Condensers—Form 9041 covers complete line of floor-mounted, direct-contact barometric condensers for the food, chemical, process and pharmaceutical industries.—Ingersoll-Rand Co., Phillipsburg, N. J.

Carbide Burs—Catalog 564 describes a complete assortment of Kellerflex carbide burs. Full descriptions and specifications are given in catalog.—Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.

Stainless Tubing and Pipe—Bulletin TDC160 can help you in the selection of stainless-steel tubing and pipe for corrosion-resistant applications. Information on the comparative corrosion resistance of stainless steels to corrosive media is given.—The Babcock & Wilcox Co., Beaver Falls, Pa.

Liquid Cyclone—Bulletin 2502 describes in detail the physical appearance, applications, advantages, and action of this multi-unit type liquid cyclone, and cites actual operating data.—The Dorr Co., Barry Place, Stamford, Conn.

Tray Belt Filter—Bulletin AH-450 covers new and radically designed dewatering filter. Bulletin includes operating details as well as a discussion of applications and operational advantages of new filter over conventional types.—Hardinge Co., Inc., 240 Arch St., York, Pa.

Hydraulic Presses—Rubber pad forming presses in capacities up to 5,000 tons are described in catalog 30-A.—E. W. Bliss Co., Canton, Ohio

Refrigeration Units—Details and operating specifications on air-cooled and water-cooled refrigeration units are available in bulletins: C-1100 B42B, B43b, and B48.—Worthington Corp., Harrison, New Jersey

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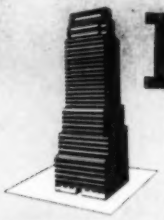

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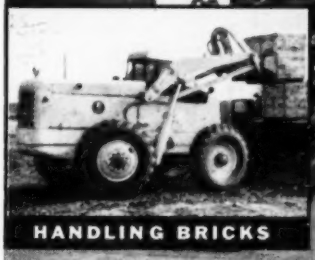

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